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# 1999 ANNUAL GROUND WATER SAMPLING REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA

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# **1999 ANNUAL GROUND WATER SAMPLING REPORT LIVINGSTON RAIL YARD LIVINGSTON, MONTANA**

*Submitted to:*

**Montana Department of Environmental Quality  
Superfund Program  
P.O. Box 200901  
Helena, Montana 59620-0901**

*Submitted by:*

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**December 29, 1999**

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## 1.0 EXECUTIVE SUMMARY

This report presents the results of the December 1998 and May 1999 ground water sampling events at the Livingston Rail Yard (LRY) in Livingston, Montana. This report also present the results of two ground water sampling events conducted at private wells east of the Yellowstone River. Long-term locomotive fueling operations at the LRY resulted in a plume of free and residual diesel fuel near the water table of the underlying aquifer beneath a portion of the LRY. Locomotive maintenance and waste-water handling operations also resulted in the presence of chlorinated volatile organic compounds (VOCs) in soils at specific areas around the LRY. In addition, a ground water plume containing dissolved chlorinated VOCs is located beneath and downgradient of the site.

The December 1998 semiannual sampling round was conducted December 14 through 17, 1998. Thirteen monitoring wells were sampled as part of this sampling event. Twelve of the samples were analyzed for volatile organic compounds (VOCs) by EPA Method 601, and three of the samples were analyzed for natural attenuation parameters (NAPs) . Thirty monitoring wells were sampled as part of the May 1999 sampling event, conducted from May 3 through 11, 1999. Twenty-six of the samples were analyzed for VOCs, and fourteen were analyzed for NAPs .

December 1998 and May 1999 ground water samples contained dissolved chlorinated-VOC concentrations that continued the long-term declines observed during the past ten years of ground water monitoring. VOC concentrations in the ground water have declined more than 90 percent since May 1989.

Of the wells containing measurable petroleum free product, most contain less than one-quarter-foot total apparent product thickness. Assuming that apparent product thickness is two to four times the actual thickness, this reveals that the majority of the petroleum free-product plume contains less than one inch of free product.

Analyses for NAPs include both reactants and products of biodegradation. NAP analyses reveal that petroleum-degrading microbes are utilizing a variety of electron acceptors, including oxygen,  $\text{NO}_3$ , and  $\text{Fe}^{+3}$ , to biodegrade hydrocarbons beneath the petroleum free-product plume.

Between October 1998 and September 1999, two private well ground water sampling events were conducted east of the Yellowstone River. On October 15, 1998, ground water samples were collected from three private wells and analyzed for VOCs. On September 28, 1999, ground water samples were collected from seven private wells and analyzed for VOCs. Only one private well was common to both events.

Two wells from the 1998 sampling event and one well from the 1999 event contained ground water with detectable concentrations of a single VOC: tetrachloroethene(PCE). One of the two detections from the October 1998 event was less than the practical quantitation limit, while the second detection from the 1998 event and the single detection from the September 1999 event were just above the detection limit, but well below the regulatory maximum contaminant level (MCL). The private well common to both events was the well that contained ground water with PCE concentrations slightly above the detection limit. No VOCs, other than PCE, were detected in samples from either event.



## 2.0 INTRODUCTION

This report is submitted to the Montana Department of Environmental Quality (MDEQ) by The Burlington Northern and Santa Fe Railway Company (BNSF). It presents the results of ground water samples and petroleum free-product thickness measurements collected during the December 1998 semiannual and May 1999 annual sampling rounds at the LRY, in Livingston, Montana. In addition, the results of ground water samples collected during two private well ground water sampling events conducted in October 1998 and September 1999 are presented in Section 5.0.

The LRY is located in the northeast part of the city of Livingston, Montana, as shown on Figure 1.0. It was constructed in 1883 by the Northern Pacific Railroad (NPRR) and, except for an 18-month period during 1986 and 1987, has operated continuously since that time. Since the introduction of diesel locomotives in the 1940's, leaks and spills during diesel fuel handling have resulted in a plume of free and residual diesel fuel overlying the water table of the underlying aquifer. Locomotive maintenance and waste-water handling has also resulted in the presence of chlorinated VOCs in soils at specific areas around the rail yard. In several places these chlorinated VOCs reached the underlying aquifer and created a plume of dissolved chlorinated VOCs in the ground water beneath and downgradient of the site.

The Burlington Northern Railroad (BNRR), the successor to NPRR, began environmental investigations at the LRY in October 1985. Since 1989, the LRY has been investigated and remediated under a Modified Partial Consent Decree (MPCD) between BNRR (later BNSF) and the MDEQ. The MPCD, signed by Charles C. Lovell, U.S. District Judge, on April 27, 1990, specifies the process by which the investigation and remediation of environmental conditions at the LRY will proceed. Regularly scheduled ground water monitoring has continued since May 1989.

The LRY is underlain by an alluvial aquifer composed of coarse-grained sand and gravel. This aquifer is herein referred to as the Livingston aquifer. Beneath most of the

LRY, the water table of the aquifer is 15 to 25 feet below the ground surface. The saturated thickness of the aquifer ranges from 10 feet to more than 50 feet.

Section 3.0 of this report presents the number of samples collected, the sample dates, and the analytical methods used for the December 1998 and May 1999 sampling events. Section 4.0 presents the analytical results of these ground water samples. Results are presented on tables showing the December 1998 and May 1999 sampling events and on maps showing the extent of dissolved chlorinated VOCs based on the May 1999 analytical results. The long-term declines in VOC concentrations are illustrated on graphs showing chlorinated VOC concentrations at specific wells during all ground water sampling events since May 1989.

### **3.0 ANNUAL & SEMI-ANNUAL GROUND WATER SAMPLING EVENTS**

The December 1998 and May 1999 sampling rounds were conducted in accordance with the ground water sampling schedule approved by MDEQ in February 1996. That sampling schedule specifies the sampling of twelve monitoring wells during semiannual sampling events (November or December) and twenty-eight monitoring and private wells during annual sampling events (May). Table 1.0 lists the December 1998 and May 1999 sample numbers, sample locations, sample dates, and sample analyses.

The locations of all December 1998 and May 1999 sampling points are shown on Figure 1.0. Tables 2.0, 3.0, and 4.0 summarize analytical results for tetrachloroethene (PCE); trichloroethene (TCE); and cis-1,2-dichloroethene (DCE), respectively. Laboratory analytical results are presented in Appendix A. A data validation report is included as Appendix B. Details of each sampling event are presented below.

#### **3.1 December 1998 Semiannual Ground Water Sampling Event**

The December 1998 semiannual sampling round was conducted December 14 through 17, 1998. Thirteen monitoring wells were sampled as part of this round. Twelve of the samples were analyzed for VOCs by EPA Method 601, and three of the samples

were analyzed for NAPs. One field duplicate and one trip blank were also submitted to the laboratory. All samples were analyzed at Energy Laboratories, Inc. in Billings, Montana.

### **3.2 May 1999 Annual Ground Water Sampling Event**

The May 1999 annual ground water sampling event was conducted May 3 through 11, 1999. During this sampling round, thirty monitoring wells were sampled (Table 1.0). Thirty-three samples were analyzed as part of the May 1999 sample event: thirty were primary samples, two were field duplicates, and one was a trip blank. Twenty-five of the primary samples were analyzed for VOCs by EPA Method 601, and one was analyzed for VOCs by EPA Method 524.2. Fourteen of the primary samples were analyzed for the NAPs sulfate ( $\text{SO}_4$ ), nitrate ( $\text{NO}_3$ ), ferrous iron ( $\text{Fe}^{2+}$ ), and methane ( $\text{CH}_4$ ). NAP analyses were conducted to evaluate the extent of natural biodegradation of diesel fuel occurring in the aquifer beneath the free- and residual-product plume.

## **4.0 SAMPLE RESULTS AND DISCUSSION**

This section presents the results of samples collected during the December 1998 and May 1999 sampling events. Analytical results for PCE, TCE, cis-DCE, and other compounds are presented on Tables 2.0 through 5.0, respectively. Results from the May sampling event are also presented on Figures 2.0 through 4.0, which show the distribution of dissolved PCE, TCE, and cis-DCE concentrations. Analytical results for the natural attenuation parameters (NAPs) are shown on Table 6.0.

Apparent thickness of the petroleum free-product plume was measured in monitoring and observation wells during both sampling events. Thickness measurements represent the "apparent" free-product thickness, as opposed to the actual thickness. The apparent thickness of petroleum free-product is believed to be approximately two to four times greater than the actual free-product thickness in the aquifer. Apparent thickness measurements are listed on Table 7.0.

#### 4.1 Ground Water VOC Sample Results

December 1998 and May 1999 ground water samples contained dissolved chlorinated-VOC concentrations consistent with the long-term declines observed during the past ten years of ground water monitoring. These concentration declines are due to the limited total mass of chlorinated VOCs originally present at the LRY and also to VOC removal during source control activities instituted on the LRY during the remedial investigation and the feasibility study. Source control activities were described in the Final Draft Soil and Ground Water Feasibility Study Report (Envirocon, 1998).

Figure 2.0 shows the distribution of dissolved PCE based on the May 1999 annual sampling round. PCE is present in a plume extending from the Electric Shop northeastward past the Yellowstone River. Although PCE is detectable over a large area, most PCE concentrations above 50 ug/l are restricted to the railyard, beneath and downgradient from the northern half of the Electric Shop and the center of the Locomotive Shop.

Monitoring Wells 94-1 and 94-2 are east of the area shown on Figure 2.0. Monitoring Well 94-1 is located approximately 1,500 feet east of the Yellowstone River and 1,500 feet north of Highway 89. Monitoring Well 94-2 is located approximately 1,000 feet east of the Yellowstone River and 100 feet south of Highway 89. As shown on Table 2.0, samples from Well 94-1 contained detectable PCE during December 1998 and May 1999. Neither of these detections were above the 5 ug/l MCL.

Figure 3.0 shows the distribution of dissolved TCE based on the May 1999 sampling event. Most monitoring wells contained TCE concentrations below the 5 ug/l Maximum Contaminant Level (MCL). TCE concentrations above the 5 ug/l MCL are restricted to a narrow area primarily within the rail yard, stretching from the Waste Water Treatment Plant (WWTP) northeastward towards the Yellowstone River.

Figure 4.0 shows the distribution of cis-DCE concentrations in the aquifer for May 1999. No cis-DCE concentrations were detected above the 70 ug/l MCL during this sampling event. The primary source area for cis-DCE is the WWTP vicinity, including the WWTP grit chambers and the WWTP sump.



Vinyl chloride was detected downgradient from the WWTP in ground water samples from Well L-87-2 (38 ug/l in December and 11 ug/l in May) and Well L-88-10 (1.7 ug/l in December). Vinyl chloride was also detected in a sample collected from Well 92-4 at a concentration of 0.98 ug/l (May). It is suspected that this vinyl chloride is created by degradation of cis-1,2-DCE in the hydrocarbon smear zone beneath the WWTP area. The MCL for vinyl chloride is 2 ug/l.

Vinyl chloride and other contaminants detected during the December and May ground water sampling events are tabulated on Table 5.0. No compounds other than PCE, TCE, and vinyl chloride exceeded their respective MCLs.

#### **4.1.1 VOC Concentration Declines**

The overall decline in dissolved chlorinated-VOC concentrations is illustrated by plotting VOC concentrations from specific wells between May 1989 and May 1999. Figures 5.0 and 6.0 show TCE and PCE concentration declines in Well L-88-10; figures 7.0 through 12.0 show PCE concentration declines in Wells 89-4, L-88-13, 92-4, 89-6, 92-2, and LS-11. These wells border private property. PCE concentrations in these wells have declined between 44 and 86 percent since May 1989.

#### **4.1.2 MDEQ Split Sample Results**

No split samples were collected by the MDEQ during either the December 1998 or the May 1999 ground water sampling event.

## 4.2 Natural Attenuation Parameter Results

Selected wells were sampled for the natural attenuation parameters: dissolved oxygen (DO), sulfate ( $\text{SO}_4$ ), nitrate ( $\text{NO}_3$ ), ferrous iron ( $\text{Fe}^{+2}$ ), and methane ( $\text{CH}_4$ ) during both the December 1998 and May 1999 sampling rounds. These parameters indicate the extent of natural biodegradation that is occurring in the aquifer beneath and around the diesel fuel plume. DO,  $\text{NO}_3$ , and  $\text{SO}_4$  are electron acceptors used by petroleum-degrading bacteria, whereas  $\text{Fe}^{+2}$  and  $\text{CH}_4$  are products of petroleum degradation (MPCA, 1996; Sturman and Meyers, 1997). Under aerobic conditions, biodegradation of hydrocarbons proceeds utilizing oxygen as the terminal electron acceptor. As oxygen is depleted, the alternative electron acceptors utilized are, in order of importance,  $\text{NO}_3$ , manganese ( $\text{Mn}^{+4}$ ),  $\text{Fe}^{+3}$ ,  $\text{SO}_4$ , and ultimately carbon dioxide ( $\text{CO}_2$ ). Utilization of  $\text{Fe}^{+3}$  yields soluble  $\text{Fe}^{+2}$  as a reaction product. Utilization of  $\text{CO}_2$  yields  $\text{CH}_4$  as a reaction product. The reactants and products of biodegradation that are most easily measured are DO,  $\text{NO}_3$ ,  $\text{SO}_4$ ,  $\text{Fe}^{+2}$ , and  $\text{CH}_4$ ; therefore, these were the compounds analyzed for during the December 1998 and May 1999 sampling rounds.

Three samples were analyzed for natural attenuation parameters (NAPs) during the December 1998 sampling round, and fourteen samples were analyzed for NAPs during the May 1999 sampling round. The wells to be sampled were chosen in two groups. One group included wells that were within or immediately downgradient of the petroleum free-product plume. The second group, chosen to evaluate background NAP concentrations, was located upgradient from the petroleum free-product plume. Figure 13.0 shows the locations of the wells and the results of the samples collected during May 1999. Table 6.0 lists the NAP sample results, broken-out by position with respect to the petroleum free-product plume.

Figure 14.0 presents 5 graphs, one for each NAP sampled. The graphs depict changes in each NAP's concentration in ground water upgradient, beneath, and downgradient of the petroleum free-product plume. The graphs clearly demonstrate that



electron donor concentrations ( $\text{DO}$ ,  $\text{NO}_3$ , and  $\text{SO}_4$ ) drop as ground water moves below the petroleum free-product plume, remain depressed until ground water passes out from beneath the petroleum free-product plume, and then concentrations rebound downgradient. In contrast, the graphs demonstrate that degradation by-product concentrations ( $\text{Fe}^{+2}$ ,  $\text{CH}_4$ ) increase as ground water passes beneath the petroleum free-product plume, remain elevated until ground water passes beyond the petroleum free-product plume, and then drop again downgradient.

#### 4.2.1 Electron Donors

Upgradient dissolved oxygen concentrations in May ranged from 4.5 to 5.6 mg/l; as ground water moved beneath the downstream portion of the petroleum free-product plume, concentrations dropped to between 1.3 and 1.8 mg/l, indicating that DO is being consumed by petroleum-degrading microbes within the petroleum free-product plume area. As ground water exited the petroleum free-product plume area and moved further downgradient, DO concentrations began to recover.

Upgradient nitrate concentrations in May ranged from 0.50 to 0.63 mg/l; as ground water passed beneath the petroleum free-product plume, concentrations began to drop. Beneath the downstream portion of the petroleum free-product plume, concentrations dropped to between 0.13 mg/l and undetectable ( $<0.05$ ), indicating that  $\text{NO}_3$  is also being used as an electron acceptor by petroleum-degrading microbes within the petroleum free-product plume area. As ground water exited the petroleum free-product plume and moved further downgradient,  $\text{NO}_3$  concentrations increased to between 0.45 and 2.30 mg/l.

Upgradient sulfate concentrations in May ranged from 30 to 35 mg/l; as ground water passed beneath the petroleum free-product plume, concentrations initially increased and then dropped in the downgradient portion of the petroleum free-product plume to between 19 and 31 mg/l. This indicates that  $\text{SO}_4$  may also be used as an electron acceptor by petroleum-degrading microbes within the petroleum free-product plume area, although

to a lesser degree than DO or  $\text{NO}_3$ . As ground water exited the petroleum free-product plume and moved further downgradient,  $\text{SO}_4$  concentrations increased to between 39 and 117 mg/l.

#### 4.2.2 Degradation By-Products

Only one of the wells up or downgradient of the petroleum free-product plume contained detectable ferrous iron; however, four wells within the petroleum free-product plume contained ground water with detectable  $\text{Fe}^{+2}$ . This indicates that  $\text{Fe}^{+2}$  is being generated by  $\text{Fe}^{+3}$  reduction by petroleum-degrading microbes within the petroleum free-product plume.

Wells up and downgradient of the petroleum free-product plume contained ground water with methane concentrations ranging from 3 to 7 ppm. In contrast,  $\text{CH}_4$  concentrations in ground water beneath the petroleum free-product plume ranged from 13 to 4,300 ppm. The wells with the lowest  $\text{NO}_3$  concentrations also contained the largest  $\text{CH}_4$  concentrations. This indicates that in the most anoxic parts of the petroleum free-product plume,  $\text{NO}_3$  is being used as an electron acceptor and  $\text{CO}_2$  is being reduced to  $\text{CH}_4$  by petroleum-degrading microbes.

In summary, NAP analyses reveal that petroleum-degrading microbes are utilizing the electron acceptors: oxygen,  $\text{CO}_2$ ,  $\text{NO}_3$ ,  $\text{SO}_4$ , and  $\text{Fe}^{+3}$  to biodegrade hydrocarbons.

#### 4.3 Free-Product Thickness Measurements

Table 7.0 shows the petroleum free-product thickness measurements collected between February 1995 and May 1999. Figure 15.0 shows the general outline of the free-product plume, the locations of the wells measured for product during May and June 1999, and the product thickness values. Of the wells containing measurable free-product, most contain less than one-quarter-foot total apparent product thickness. Assuming that apparent product thickness is two to four times the actual thickness, this reveals that the majority of the petroleum free-product plume contains less than one inch of free product.

## **5.0 PRIVATE GROUND WATER SAMPLING EVENTS EAST OF THE YELLOWSTONE RIVER**

This section presents the results of two ground water sampling events conducted at private wells on the far side of the Yellowstone River east of Livingston Montana. The two sampling events were conducted on October 15, 1998 and September 28, 1999. During the October 1998 event, three privately owned ground water wells were sampled; during the September 1999 event, seven privately owned ground water wells were sampled. Only the O'Hare Shop well was sampled during both events. All private well samples were analyzed for VOCs. Static water levels (SWLs) were measured during the September 1999 event.

Figure 16.0 depicts the area east of the Yellowstone River, together with well locations, ground water elevations, inferred hydraulic gradient, and analytical results. Figure 17.0 depicts the areal extent of the Livingston Aquifer. Table 9.0 presents analytical results for both private well sampling events. Copies of the sample analytical reports are presented in Appendix C and available well logs are presented in Appendix D.

Ground water samples were collected after first purging the monitoring wells. Purging and sample collection were accomplished by running water from the household tap nearest the well for an extended period (over 5 minutes). Latex gloves were worn during sample collection. Samples were collected into pairs of 40-milliliter septum-capped vials. The samples were placed on ice in coolers, a chain-of-custody form was prepared and enclosed, and the samples were Fed-Exed to Energy Laboratory of Billings for analysis.

### **5.1 October 1998 Private Well Sampling Event**

Three privately-owned ground water wells were sampled on October 15, 1998. Ground water samples were analyzed for VOCs by EPA Method 524.2. Static water levels were not measured during this event. The MDEQ's representative was present throughout the event.

One of the three ground water samples collected on October 15, 1998 did not contain any detectable VOCs. The ground water sample collected from the O'Hare Shop well contained one detectable analyte, Tetrachloroethene (PCE), at a concentration slightly above the detection limit. The ground water sample collected from the Park Lumber well contained one detectable analyte, PCE, at a concentration less than the practical quantitation (i.e. detection) limit.

**Park Lumber Water Well:** Ground water from the well sampled at the Park Lumber Company is for domestic and industrial use. Well log information was not available. The well is 6-inch diameter and probably constructed of steel casing.

The Park Lumber Company well is located 3,200 feet from the Yellowstone River. PCE was detected at an estimated concentration of 0.38 parts-per-billion (ppb) in Sample No. "Park Lumber". This indicates that ground water near this well contained a minor concentration of PCE. The detection limit for PCE was 1.0 ppb and the Federal Safe Drinking Water Act's Maximum Contaminant Level (MCL) for PCE is 5.0 ppb.

**Myrstol Post and Pole Water Well:** Ground water from the well sampled at the Myrstol Post and Pole Company is for domestic and industrial use. Well log information was not available. The well is 6-inch diameter and probably constructed of steel casing.

The Myrstol Post and Pole Company well is located 3,400 feet from the Yellowstone River. No VOCs were detected in Sample No. "Myrstol", indicating that ground water near this well did not contain detectable levels of VOCs in October 1998.

**O'Hare Shop Water Well:** Ground water from the well sampled at the O'Hare Shop is for domestic and light industrial use. The well is constructed of 6-inch diameter steel casing. It was completed at a total depth of 39 feet below ground surface (bgs), into a lens of "red clay-dry". No casing perforations or well screen interval were noted on the well log, and the height of the submersible pump within the well is unknown.



The O'Hare Shop well is located approximately 2500 feet from the Yellowstone River. PCE was detected at a concentration of 1.5 ppb in Sample No. O'Hara. This indicates that ground water near this well contained PCE at a concentration less than the regulatory limit of 5.0 ppb.

## **5.2 September 1999 Private Well Sampling Event**

Seven privately-owned ground water wells were sampled on September 28, 1999. Samples collected by Envirocon were analyzed for purgeable organics by EPA Method 624/8260. The MDEQ's representative was present throughout the sampling event and collected a split, or duplicate, sample from one of the wells as a quality control check. The split sample was analyzed by EPA Method 524.2. In addition to ground water sampling, two of the sampled wells, plus five other wells in the same area were measured for static water levels during the September 1999 event.

### **5.2.1 Static Water Level (SWL) Measurements**

Static water levels were measured at the following seven wells on September 28th, 1999:

- O'Hare Shop,
- Humane Society well,
- Boyd Trucking,
- John Kaiser (Fridley Construction),
- Monitoring Well # 94-1 on the Rustad property,
- Monitoring Well # 94-2 on the Watson property, and
- Monitoring Well # 92-2 on MRL Railroad property.

SWL measurements were obtained to determine the local hydraulic gradient. This gradient is useful in evaluating the direction of ground water flow. Water level measurements, with conversions to elevations, are presented on Table 8.0; well locations, SWL elevations, the inferred ground water elevation contours, and the inferred hydraulic gradient are presented on Figure 16.0. Based on inferred ground water elevation contours,

ground water during September 1999 appeared to flow towards the northeast.

### **5.2.2 Ground Water Analytical Results**

Six of the seven private well samples collected on September 28, 1999 did not contain detectable VOCs. The ground water sample collected from the O'Hare Shop well contained one detectable analyte, PCE, at a concentration slightly above the detection limit. Table 9.0 presents analytical results for ground water samples collected from the private water wells. Copies of the September 1999 sample analytical reports are presented in Appendix C and well logs are presented in Appendix D.

**Yellowstone Veterinarian Water Well:** Ground water from the well sampled at the Yellowstone Veterinarian is used for medical (human and animal consumption), and possibly for irrigation. Well log information was incomplete for this well. The well is 6-inch diameter and probably constructed of steel casing. It was completed at a total depth of 34 feet below ground surface (bgs); there is no record as to whether bedrock was encountered. No casing perforations or screen interval were noted on the well log. A submersible pump may be positioned in the well casing somewhere below 10 feet bgs.

The Yellowstone Veterinarian well is located 3,700 feet from the Yellowstone River. No VOCs were detected in Sample No. "Yellowstone Vet". This indicates that ground water near this well did not contain detectable levels of VOCs in September 1999.

**Hillman Water Well:** Ground water from the well sampled at the Hillman Shop is for domestic consumption and is constructed of 6-inch steel casing. It was completed at a total depth of 27 feet bgs, within a 40-foot deep boring; bedrock (shale) was encountered at 28 feet bgs. No casing perforations or well screen interval were noted on the well log. The submersible pump is probably positioned in the well casing somewhere below 10 feet bgs.



The Hillman Shop well is located 2,500 feet from the Yellowstone River. No VOCs were detected in Sample No. "Hilman". This indicates that ground water near this well did not contain detectable levels of VOCs in September 1999.

**Fridley Construction (John Kaiser) Water Well:** Ground water from the well sampled at Fridley construction is for domestic use. The well is constructed of 6-inch steel casing to 25 feet and of 4-inch diameter PVC from 20 to 60 feet bgs. The well was completed at a total depth of 60 feet bgs; bedrock (blue shale) was encountered at 32 feet bgs. No casing perforations or well screen interval were noted on the well log, and the height of the submersible pump within the well is unknown.

The Fridley Construction well is located approximately 4600 feet from the Yellowstone River. No VOCs were detected in Sample No. "Fridley". This indicates that ground water near this well did not contain detectable levels of VOCs in September 1999.

**Humane Society Water Well:** Ground water from the well sampled at the Humane Society is for domestic (human and animal) use. The well is constructed of 6-inch diameter steel casing and was completed at a total depth of 40 feet bgs; no bedrock was encountered. No casing perforations or well screen interval were noted on the well log, and the height of the submersible pump within the well is unknown.

The Humane Society well is located 4050 feet from the Yellowstone River. No VOCs were detected in Sample No. "Humane Society". This indicates that ground water near this well did not contain detectable levels of VOCs in September 1999.

**Greybeal Appliance Water Well:** Ground water from the well sampled at Greybeal Appliance is for domestic use. The well is constructed of 6-inch diameter steel casing. It was completed at a total depth of 58 feet bgs; bedrock was not encountered at a boring depth of 60 feet bgs. No casing perforations or well screen interval were noted on the well log, and the height of the submersible pump within the well is unknown.

The Greybeal Appliance well is located approximately 5,000 feet from the Yellowstone River. No VOCs were detected in Sample No. "Greybeal". This indicates that ground water near this well did not contain detectable levels of VOCs in September 1999.

**O'Hare Shop Water Well:** The O'Hare Shop well use and construction are presented in Section 5.1, above. This is the only well sampled during both private well sampling events.

Tetrachloroethene (PCE) was detected at a concentration of 1.2 ppb in Sample No. "Ohare". The October 1998 sample did not contain detectable PCE. These results indicate that ground water near this well intermittently contain a minor concentration of PCE. The detection limit for PCE was 1.0 ppb and the Federal Safe Drinking Water Act's Maximum Contaminant Level (MCL) for PCE is 5.0 ppb.

A split (duplicate) sample was collected from the O'Hare well by the MDEQ's representative as a quality control check. The split sample was analyzed by the Montana Department of Public Health and Human Services' Environmental Laboratory for the same analytes (VOCs) and by the same method (Method 524.2) as the primary sample. PCE was the only analyte detected, at a concentration of 1.39 ppb, which is within acceptable QC limits for the duplicate/primary pair of water samples.

**Rustad Residence Water Well:** Ground water from the well sampled at the Rustad residence is used for domestic consumption and possibly irrigation. The well is a hand-dug cistern constructed of pipe, rock, and tile. It was completed at a total depth of 10 feet bgs. The intake of the electric pump is positioned near the base of the well.

The Rustad Residence well is located approximately 1000 feet from the Yellowstone River. No VOCs were detected in Sample No. "Rustad House". This indicates that ground water near this well did not contain detectable levels of VOCs in September 1999.

## 6.0 CONCLUSIONS

This report presents the results of the tenth complete year of ground water sampling at the LRY. The two primary ground water concerns at the LRY are a plume of dissolved chlorinated VOCs in the aquifer and a plume of free and residual diesel fuel at the water table. These two plumes had separate source areas and only partially overlap.

The concentrations of dissolved chlorinated VOCs have declined significantly since 1989. The 1998 and 1999 ground water monitoring results are consistent with this trend. At most monitoring well locations, the dissolved chlorinated-VOC concentrations have declined more than 90 percent since 1989.

We can reasonably expect VOC concentrations to continue to decline in wells downgradient of the Livingston Railyard, both west and east of the Yellowstone River. This assumption is based on the dynamic nature of the aquifer, demonstrated natural attenuation of contaminants, and favorable impacts from source removal activities currently underway.

The apparent thickness of the petroleum free-product plume has also declined since regularly scheduled measurements began in 1989. This is, at least in part, due to biodegradation by indigenous microbes. Measurements of both reactants and products of biodegradation within ground water beneath the petroleum free-product plume reveal that biodegradation is occurring.

VOCs associated with the Livingston Railyard are generally undetectable in private water wells east of the Yellowstone River. One VOC analyte (PCE) was detected below the practical quantitation limit in one of the three private wells sampled during October 1998 and just above the detection limit in the only private well sampled during both October 1998 and September 1999. These detections were all considerably less than the regulatory MCL for safe drinking water. During September 1999, ground water appeared to flow towards the northeast in the area of wells measured for SWLs.

## 7.0 REFERENCES

MPCA, 1996, Assessment of Natural Biodegradation at Petroleum Release Sites; Minnesota Pollution Control Agency Fact Sheet #3.21; May 1996.

Sturman and Meyers, 1997, Intrinsic Bioremediation as a Remedial Option at Petroleum Contaminated Sites; notes and appendices from presentation.

Envirocon, 1998, Final Draft Soil and Ground Water Feasibility Study Report, Livingston Rail Yard, Livingston, Montana. Prepared for The Burlington Northern and Santa Fe Railway Company; January 1998.

## TABLES





**Table 1.0**  
**December 1998 and May 1999 Ground Water Samples**  
**1999 Annual Ground Water Report**

Sample Number	Sample Location	Sample Date	Analyses
140101-1637	L-87-8	12/14/98	601
140101-1638	94-1	12/15/98	601
140101-1639	89-2	12/16/98	NAP
140101-1640	89-4	12/16/98	601
140101-1641	90-3	12/16/98	601
140101-1642	94-2	12/16/98	601
140101-1643	92-2	12/16/98	601
140101-1644	L-87-5	12/16/98	601
140101-1645	Trip blank	12/17/98	601
140101-1646	92-1	12/17/98	601
140101-1647	L-88-10	12/17/98	601, NAP
140101-1648	L-87-2	12/17/98	601, NAP
140101-1649	89-9	12/17/99	601
140101-1650	89-9 dupl.	12/17/98	601
140101-1651	89-3	12/17/98	601
140101-1652	89-6	5/3/99	601
140101-1653	89-10	5/3/99	601
140101-1654	89-4	5/3/99	601
140101-1655	92-4	5/3/99	601
140101-1656	89-2	5/4/99	601, NAP
140101-1657	L-87-3	5/4/99	601, NAP
140101-1658	L-87-2	5/4/99	601, NAP
140101-1659	L-88-13	5/4/99	601, NAP
140101-1660	L-88-10	5/4/99	601, NAP
140101-1661	L-88-9	5/4/99	NAP
140101-1662	4	5/4/99	601
140101-1663	4 dupl.	5/4/99	601
140101-1664	5	5/4/99	601
140101-1665	6	5/4/99	601
140101-1666	L-87-8	5/5/99	601, NAP
140101-1667	L-87-7	5/5/99	601, NAP
140101-1668	1	5/5/99	601
140101-1669	2	5/5/99	601, NAP
140101-1670	3	5/4/99	601, NAP
140101-1671	LS-11	5/6/99	601
140101-1672	Trip Blank	5/6/99	601
140101-1673	90-3	5/6/99	601
140101-1674	94-2	5/6/99	601
140101-1675	92-2	5/6/99	601
140101-1676	94-1	5/6/99	601
140101-1677	B Street Well	5/7/99	524.2
140101-1678	89-9	5/7/99	601
140101-1679	89-9 dupl.	5/7/99	601
140101-1680	89-3	5/10/99	601
140101-1681	L-87-1	5/11/99	NAP
140101-1682	L-87-4	5/11/99	601, NAP
140101-1683	92-3	5/11/99	NAP
140101-1684	95-1	5/11/99	NAP

## Notes:

601 - EPA Method 601- VOCs

524.2 - EPA Method 524.2 - VOCs

NAP - Natural Attenuation Parameters - DO, NO<sub>3</sub>, SO<sub>4</sub>, Fe<sup>+2</sup>, CH<sub>4</sub>

**Table 2.0**  
**PCE Analytical Results**  
**1999 Annual Ground Water Report**

MCL = 5 ug/l (exceedances in bold)

Sample Location	November 1995 (ug/l)	May 1996 (ug/l)	November 1996 (ug/l)	May 1997 (ug/l)	November 1997 (ug/l)	May 1998 (ug/l)	December 1998 (ug/l)	May 1999 (ug/l)
1	<0.5J			<0.5		<0.5		<0.5
2		<0.5J		0.5J		<0.5J		<0.5J
3		<0.5J		<0.5		NS		<0.5J
4		<0.5J		<0.5		<0.5		<0.5
5	0.63	<0.5J		<0.5		<0.5J		<0.5J
6	1.2	1.4		<0.5		0.74		<0.5J
89-2	<0.5	<0.5		<0.5		<0.5		<0.5
89-3	199	205	172	163	204	134	111D	130D
89-4	84	137	NS <sup>1</sup>	87	99	59	86D	80D
89-6		16		12		15		14
89-9	62		59	69	58	NS	48D	41D
89-10		55		35		48		36D
90-3		29	12	11	8.4	20	18	17D
90-6	0.73							
92-1	109	55	NS <sup>2</sup>	85	217	168	60D	
92-2	27	9.7	21	NS <sup>3</sup>	13	8.1	2.4	6.6
92-3	<0.5J							
92-4	4.4	28		2.4		33		21D
94-1	2.4	1.8	3.6	NS <sup>3</sup>	1.9	1.6	1.8	1.6
94-2	<0.5J	<0.5J	<0.5J	NS <sup>3</sup>	<0.5J	<0.5J	<1.0	<0.5
L-87-2	1.8	<0.5	<0.5	<0.5	<0.5	<0.5J	<1.0	<0.5
L-87-3	89	76		44		49		46D
L-87-4		<0.5		<0.5		<0.5		<0.5
L-87-5	51	64	NS (dry)	69		NS	47D	
L-87-7				<0.5		<0.5		<0.5
L-87-8	3.9	2.4	2.4	2.5	1.7	3.4	<1.0	1.7
L-88-10	40	30	29	19	28	27	23D	29D
L-88-13		16		15		14		13
LS-11	20	34		25		17		17
B-Street		<0.5		<0.5		<0.5		<0.5
Rainbow				NS <sup>4</sup>		7.6		

Notes:

J - Compound was detectable but less than the practical quantification limit.

D - Value was derived from a 10 times dilution.

NS<sup>1</sup> - Well 89-4 had been vandalized and could not be sampled in November 1997.

NS<sup>2</sup> - Well 92-1 was mistakenly not sampled during November 1997.

NS<sup>3</sup> - Wells 92-2, 94-1, and 94-2 were not accessible for sampling during May 1997 due to flooding of the Yellowstone River.

NS<sup>4</sup> - The Rainbow Motel well was not operational during May 1997.

**Table 3.0**  
**TCE Analytical Results**  
**1999 Annual Ground Water Report**  
MCL = 5 ug/l (exceedances in bold)

Sample Location	November 1995 (ug/l)	May 1996 (ug/l)	November 1996 (ug/l)	May 1997 (ug/l)	November 1997 (ug/l)	May 1998 (ug/l)	December 1998 (ug/l)	May 1999 (ug/l)
1	<0.5			<0.5		<0.5		<0.5
2		<0.5		<0.5		<0.5		<0.5
3		<0.5		<0.5		NS		<0.5
4		<0.5		<0.5		<0.5		<0.5
5	<0.5	<0.5		<0.5		<0.5		<0.5
6	<0.5	<0.5		<0.5		<0.5		<0.5
89-2	<0.5	<0.5		<0.5		<0.5		<0.5
89-3	0.59	1.4	0.82	0.97	2.2	0.7	1.4	1.5
89-4	1.5	1.2	NS <sup>1</sup>	1.1	1.7	1.4	1.6	1.2
89-6		<0.5J		<0.5J		<0.5J		<0.5J
89-9	2.7		2.4	<b>5.6</b>	4.1	NS	3	2.2
89-10		<b>5.5</b>		4.3		4.9		3.6
90-3		2.6	2.1	1.2	2.0	2.0	1.9	1.5
90-6	<0.5							
92-1	<0.5J	<0.5J	NS <sup>2</sup>	<0.5J		1.1	<1.0	
92-2	3.7	0.67	2.0	NS <sup>3</sup>	1.2	0.57	<1.0	<0.5J
92-3	<0.5							
92-4	1.0	1.4		<0.5J		1.3		1.1
94-1	<0.5	<0.5	<0.5	NS <sup>3</sup>	<0.5	<0.5	<1.0	<0.5
94-2	<0.5	<0.5	<0.5	NS <sup>3</sup>	<0.5	<0.5	<1.0	<0.5
L-87-2	3.7	<b>14</b>	1.9	3.2	4.5	<b>11</b>	1.5	<b>6.2</b>
L-87-3	<b>8.8</b>	<b>8.3</b>		<b>7.5</b>		<b>6.8</b>		<b>5.3</b>
L-87-4		<0.5		<0.5		<0.5		<0.5
L-87-5	3.0	3.4	NS(dry)	5.0		NS	3	
L-87-7				<0.5		<0.5		<0.5
L-87-8	1.9	2.2	1.6	0.74	1.1	3.8	4.1	6.1
L-88-10	<b>15</b>	<b>11</b>	<b>16</b>	<b>8.7</b>	<b>11</b>	<b>9.1</b>	<b>9.5</b>	<b>8.4</b>
L-88-13		2.5		2.4		2.3		1.9
LS-11	<b>6.8</b>	<b>6.8</b>		<b>5.6</b>		<b>6.8</b>		<b>7.2</b>
B-Street		<0.5		<0.5		<0.5		<0.5
Rainbow				NS <sup>4</sup>		1.6		

## Notes:

J - Detectable but less than the practical quantification limit.

NS<sup>1</sup> - Well 89-4 had been vandalized and could not be sampled in November 1997.NS<sup>2</sup> - Well 92-1 was mistakenly not sampled during November 1997.NS<sup>3</sup> - Wells 92-2, 94-1, and 94-2 were not accessible for sampling during May 1997 due to flooding of the Yellowstone River.NS<sup>4</sup> - The Rainbow Motel well was not operational during May 1997.

**Table 4.0**  
**cis-1,2-DCE Analytical Results**  
**1999 Annual Ground Water Report**

MCL = 70 ug/l (exceedances in bold)

Sample Location	November 1995 (ug/l)	May 1996 (ug/l)	November 1996 (ug/l)	May 1997 (ug/l)	November 1997 (ug/l)	May 1998 (ug/l)	December 1998 (ug/l)	May 1999 (ug/l)
1	<0.5			<0.5		<0.5		<0.5
2		<0.5		<0.5		<0.5		<0.5
3		<0.5		<0.5				<0.5
4		<0.5		<0.5		<0.5		<0.5
5	<0.5	<0.5		<0.5		<0.5		<0.5
6	<0.5	<0.5		<0.5		<0.5		<0.5
89-2	<0.5	<0.5		<0.5		<0.5		<0.5
89-3	<0.5	0.54	<0.5	<0.5	<0.5	<0.5	<1.0	0.62
89-4	3.1	2.9	NS <sup>1</sup>	2.5	6.2	4.0	3.3	1.4
89-6		<0.5		<0.5		<0.5		<0.5
89-9	1.1		0.84	3.2	4.3		1.8	1.2
89-10		8.3		4.2		5.4		3.4
90-3		2.8	1.7	<0.5J	2.6	1.0	1.0	0.53
90-6	<0.5							
92-1	12	21	NS <sup>2</sup>	8.6	4.6	12	4.6	
92-2	4.1	0.74	1.6	NS <sup>3</sup>	0.92	<0.5J	<1.0	<0.5J
92-3	<0.5							
92-4	<0.5J	0.81		<0.5		1.4		<0.5J
94-1	<0.5	<0.5	<0.5	NS <sup>3</sup>	<0.5	<0.5	<1.0	<0.5
94-2	<0.5	<0.5	<0.5	NS <sup>3</sup>	<0.5	<0.5	<1.0	<0.5
L-87-2	<b>88</b>	23	54	21	41	19	33D	17
L-87-3	11	14		12		7.9		6.9
L-87-4		<0.5		<0.5		<0.5		<0.5
L-87-5	1.2	0.91	NS (dry)	3.3			1.9	
L-87-7				<0.5		<0.5		<0.5
L-87-8	1.4	0.55	<0.5J	<0.5J	<0.5J	<2.5J	<1.0	1.6
L-88-10	39	16	24	12	22	13	18	13
L-88-13		0.68		1.0		1.1		0.79
LS-11	9.0	10		5.9		6.7		7.6
B-Street		<0.5		<0.5		<0.5		<0.5
Rainbow				NS <sup>4</sup>		1.2		

Notes:

J - Detectable but less than the practical quantification limit.

NS<sup>1</sup> - Well 89-4 had been vandalized and could not be sampled in November 1997.

NS<sup>2</sup> - Well 92-1 was mistakenly not sampled during November 1997

NS<sup>3</sup> - Wells 92-2, 94-1, and 94-2 were not accessible for sampling during May 1997 due to flooding of the Yellowstone River.

NS<sup>4</sup> - The Rainbow Motel well was not operational during May 1997.



Table 5.0

## Other Compounds Detected

ug/l (ppb)

Location	Date	Vinyl Chloride	Chlorobenzene	1,2-dichlorobenzene	1,4-dichlorobenzene	trans-Dichloroethene	2-Chlorotoluene	Bromoform	Chloroform	Bromodichloromethane	Chlorodibromomethane
	<b>MCL =</b>	<b>2</b>	<b>100</b>	<b>600</b>	<b>75</b>	<b>100</b>	<b>not regulated</b>	<b>**** (sum of these four compounds = less than 100) ****</b>			
1	May-99							0.92	0.94	0.96	1.4
2	May-99										0.6
92-4	May-99	0.98									
L-87-2	May-99	11	21	1.5	2.9	0.9	33				
"	Dec-98	38	37	2.0	4.0	1.6	45				
L-88-10	May-99		1.9		0.88						
"	Dec-98	1.7	6.4								
LS-11	May-99		1.5		2.9						
B-Street	May-99							0.78			



Table 6.0

**Natural Attenuation Parameter Results  
1999 Annual Ground Water Report**

**December 1998 Sampling Event**

\*\*\*\*\*Electron Donors (consumed)\*\*\*\*\*

**Degradation Products**

Well Location	Dissolved Oxygen DO [mg/l]	Nitrate (NO3) [mg/l]	Sulfate (SO4) [mg/l]	Ferrous Iron Fe +2 [mg/l]	Methane CH4 [ppmv]
<b>Wells Within the Plume</b>					
L-87-2	2.0	<0.05	20	1.3	5150
<b>Wells Downgradient from the Plume, Moving Progressively Away</b>					
L-88-10	2.0	0.07	60	<0.1	11
89-2	6.0	0.20	36	<0.1	3

**May 1999 Sampling Event**

\*\*\*\*\*Electron Donors (consumed)\*\*\*\*\*

**Degradation Products**

Well Location	Dissolved Oxygen DO [mg/l]	Nitrate (NO3) [mg/l]	Sulfate (SO4) [mg/l]	Ferrous Iron Fe +2 [mg/l]	Methane CH4 [ppmv]
<b>Wells Upgradient from the Plume</b>					
L-87-1	5.2	0.50	30	0.4	4
L-88-9	4.5	0.56	33	<0.1	3
92-3	5.6	0.63	35	<0.1	5
<b>Wells Within the Plume, Moving Downgradient</b>					
95-1	4.8	0.70	41	1.6	49
L-87-4	3.4	0.56	35	<0.1	13
L-87-7	1.3	<0.05	19	0.1	2024
L-87-8	1.8	0.13	31	8.5	790
L-87-2	1.3	<0.05	23	1.2	4300
<b>Wells Downgradient from the Plume, Moving Progressively Away</b>					
L-88-13	2.0	0.61	39	<0.1	7
L-88-10	1.4	0.45	60	<0.1	4
L-87-3	2.4	2.30	117	<0.1	3
89-2	4.5	0.46	43	<0.1	4
<b>Wells Downgradient &amp; to the Side of the Plume, Moving Downgradient</b>					
2	4.4	1.12	45	<0.1	5
3	4.8	3.27	45	<0.1	4

Table 7.0

**February 1995 Through May 1999**  
**Apparent Free-Product Thickness Measurements**  
**1999 Annual Ground Water Report**  
[feet]

Well	Feb-95	May-95	Aug-95	Nov-95	May-96	Nov-96	May-97	Nov-97	May-98	May-99	Jun-99	Avg.
LB-4	0.12	0.45	0.65				0.66	0.42	0.28	0.39	0.40	0.42
L-87-2	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND
L-87-4	ND	ND	0.19	0.10		0.39	0.98	0.68	0.11		0.03	0.35
L-87-6											0.01	0.01
L-87-7	0.78	0.24	0.65	0.70	0.24	0.46	0.90	0.48	0.33		0.55	0.53
L-87-8	1.35	0.12	0.31	0.27	0.11	0.40	0.24	0.23			0.01	0.34
L-88-13											<0.01	<0.01
HRO-4								0.41				0.41
HRO-6	0.63	0.36	0.52		0.65	0.74	0.43	0.70	0.37	0.34	0.04	0.48
HRO-7							0.58	0.61	0.27	0.20	<0.01	0.42
HRO-8			ND					dry				ND
HRO-9	0.06				0.03		0.04	0.05	0.03	0.03	0.02	0.04
HRO-10	<0.01		<0.01		ND			<0.01				<0.01
HRO-11		0.23	ND									0.23
HRO-12	<0.01	ND	ND		ND							ND
HRO-13	ND	ND	ND		ND							ND
HRO-14	ND	<0.01			ND							ND
HRO-15	0.07	<0.01										0.07
HRO-16	0.50	0.04										0.27
HRO-20	0.13	ND	0.06	0.16	0.03		ND	0.15				0.11
HRO-21	<0.01	ND	ND	<0.01	ND		<0.01					<0.01
HRO-22	ND	<0.01	ND	0.01	ND		0.01	0.06				0.03
HRO-23	ND	ND	ND		ND		ND	ND				ND
HRO-24	0.14	0.01	0.14	0.24	ND		0.03	0.17				0.12
RW-1	ND	0.01			ND		ND			<0.01	0.01	<0.01
RW-2	ND	<0.01			ND		ND			0.01	0.01	<0.01
RW-3	0.03	<0.01					0.15			0.10	0.10	0.10
RW-4	ND	0.16			0.40		0.34			1.01	0.41	0.46
RW-5	0.07	0.24										0.16
RW-6	0.14*	0.22*			0.13		0.36			0.23	0.36	0.27
RW-7	0.40	0.04	0.19	0.25	ND	0.26	0.06	0.20	0.13	0.17	0.01	0.17
RW-8	0.02	0.03	0.15	0.17			0.04			0.05	0.02	0.07
RW-9	ND	ND	ND	0.01	ND	ND	ND	ND	ND	<0.01	0.01	<0.01
LG-11					ND							ND
LG-12					ND							ND
95-1					ND	ND	ND				0.01	<0.01
LPZ-100	0.04							0.17				0.11

## Notes:

ND - No product detected

&lt;0.01 - Trace of product detected, but less than the resolution of the product probe's scale

\* - Approximately 35 gallons of product recovered from Well RW-6 during December 1994

**Table 8.0**

**SWL Measurements  
Wells East of the Yellowstone River**

**Measured 9/28/99**

<b>Well Location</b>	<b>TOC Elevation [ft above msl]</b>	<b>Static Water Level [feet below TOC]</b>	<b>Water Elevation [ft above msl]</b>
Humane Society	4447.09	14.87	4432.22
Boyd Trucking	4452.10	17.52	4434.58
John Kaiser	4453.47	16.79	4436.68
O'Hare Shop	4448.42	12.06	4436.36
94-1	4451.99	9.70	4442.29
94-2	4458.95	8.12	4450.83
92-2	4461.19	8.22	4452.97

**Table 9.0**

**Groundwater Sample Results  
Private Wells East of the Yellowstone River**

**October 15, 1998 Sampling Event**

<b>Sample Location</b>	<b>Tetrachloroethene [ppb]</b>	<b>Other VOCs by EPA Method 601</b>
Park Lumber	0.38 J	ND
Myrstol Post & Pole	< 1.0	ND
O'Hare Shop	1.5	ND

J - estimated value: present, but less than the practical quantitation limit

**September 28, 1999 Sampling Event**

<b>Sample Location</b>	<b>Tetrachloroethene [ppb]</b>	<b>Other VOCs by EPA Method 601</b>
Yellowstone Veterinary Clinic	< 1.0	ND
Hillman Shop	< 1.0	ND
Fridley Construction	< 1.0	ND
Humane Society	< 1.0	ND
Graybeal	< 1.0	ND
O'Hare Shop	1.2	ND
Rustad House	< 1.0	ND

ND - not detected





## FIGURES





THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

ENVIROCON, INC.

LIVINGSTON RAILYARD  
1999 ANNUAL  
GROUND WATER REPORT

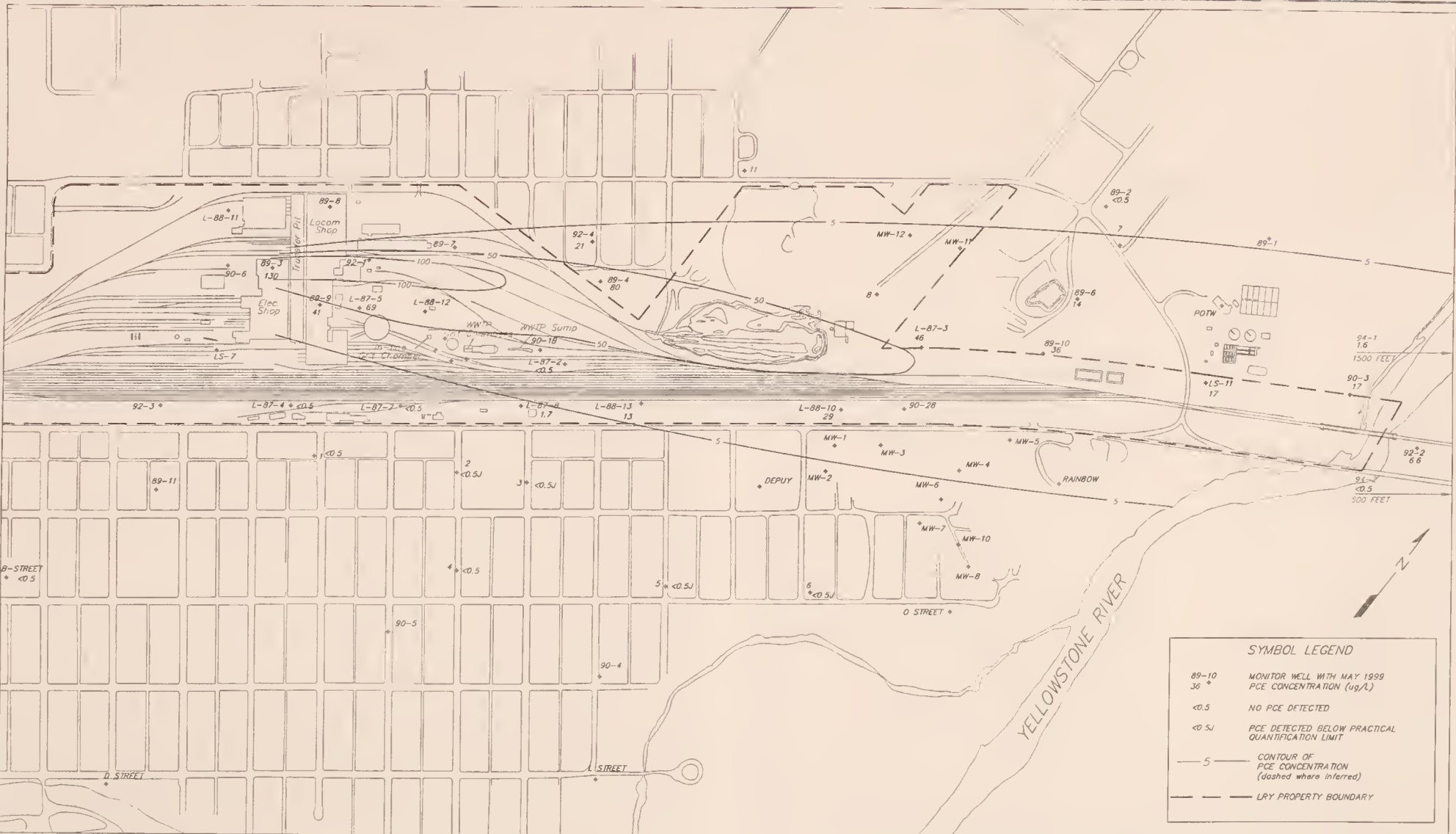
140101

GROUND WATER SAMPLING  
AND WATER LEVEL  
MEASUREMENT LOCATIONS

12/1/99

FIGURE 1.0





500 0 500  
SCALE IN FEET

BURLINGTON NORTHERN  
SANTA FE RAILROAD COMPANY

ENVIROCON, INC.

LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

Acad file: 140101/GWR-PCE99

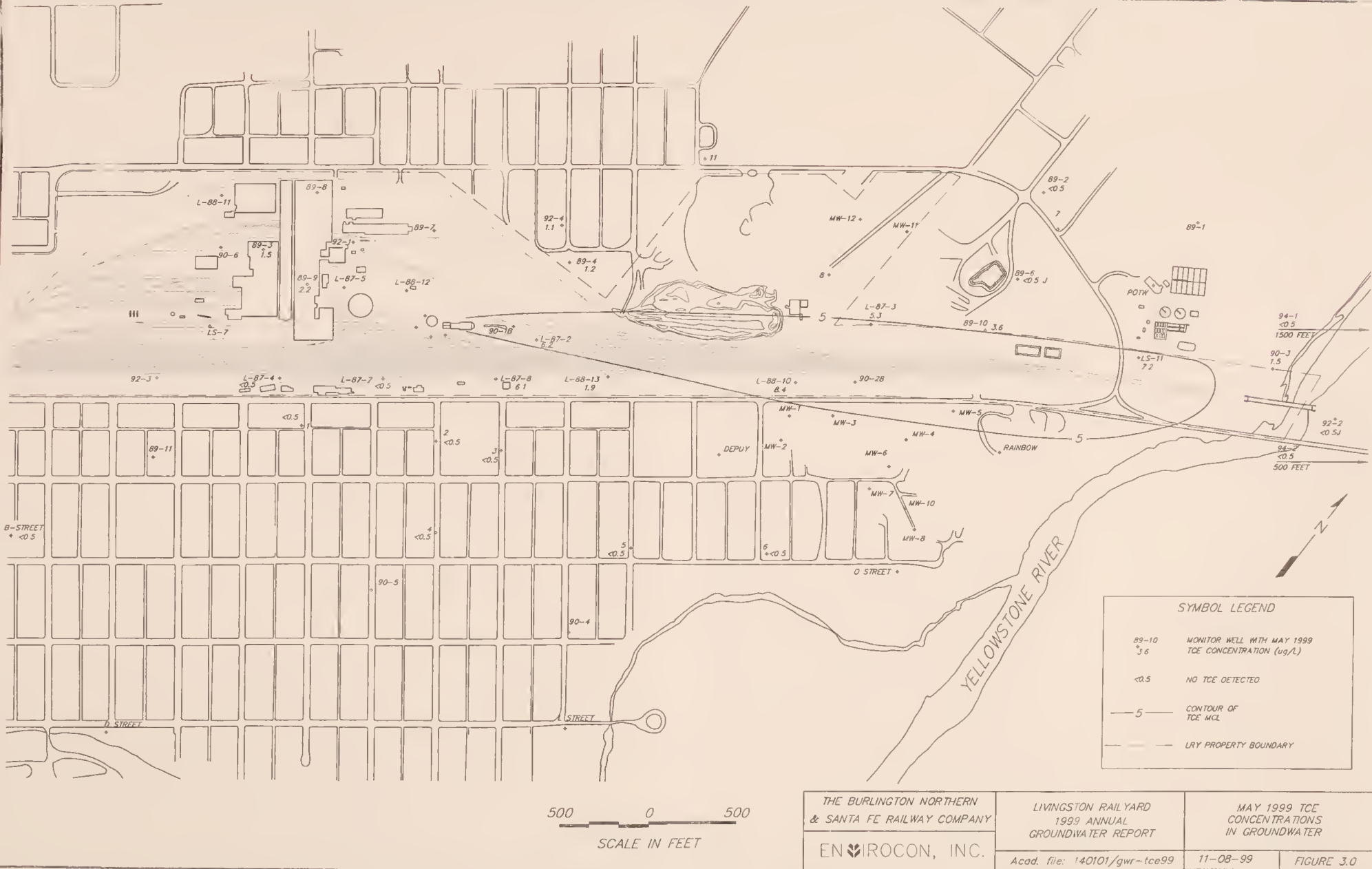
MAY 1999 PCE  
CONCENTRATIONS

12-01-99

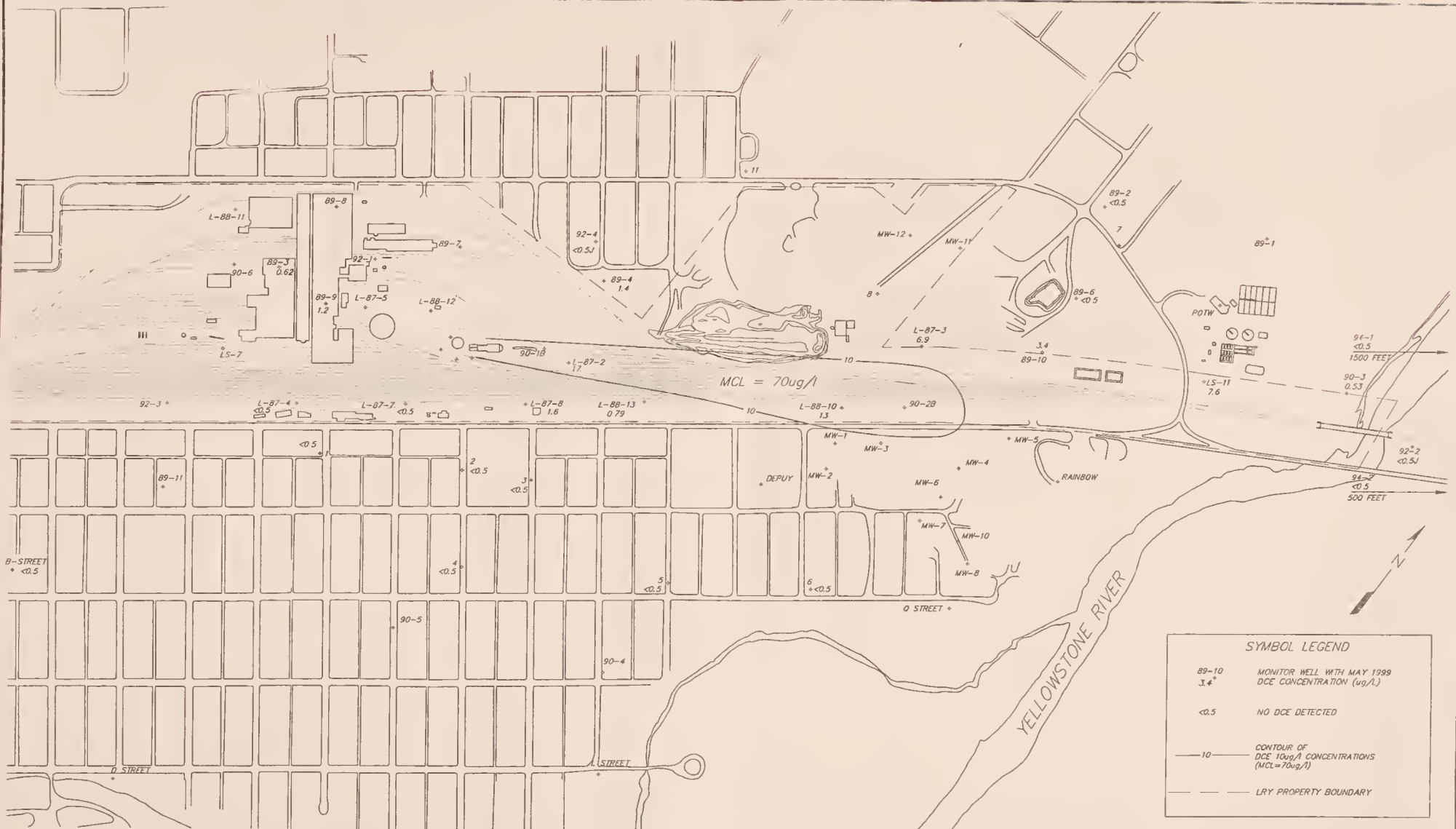
FIGURE 2.0











500 0 500  
SCALE IN FEET

THE BURLINGTON NORTHERN  
& SANTA FE RAILWAY COMPANY

ENVIROCON, INC.

LIVINGSTON RAILYARD  
1999 ANNUAL  
GROUNDWATER REPORT

Acad. file: 140101/GWR-DCE99

MAY 1999  
cis-1,2-DCE  
CONCENTRATIONS  
IN GROUNDWATER

11-08-99

FIGURE 4.0





EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = -1.9  
% DECLINE OBSERVED = 74%

Pair of dotted lines delineates the envelope containing the means of the data points at each point in time with a 95% degree of statistical confidence. I.E. the solid line described above could vary anywhere within this inner envelope.

ESTIMATED TIME FRAME FOR  
COMPLIANCE WITH MCL LEVEL  
1/2003

THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

ENVIROCON, INC.

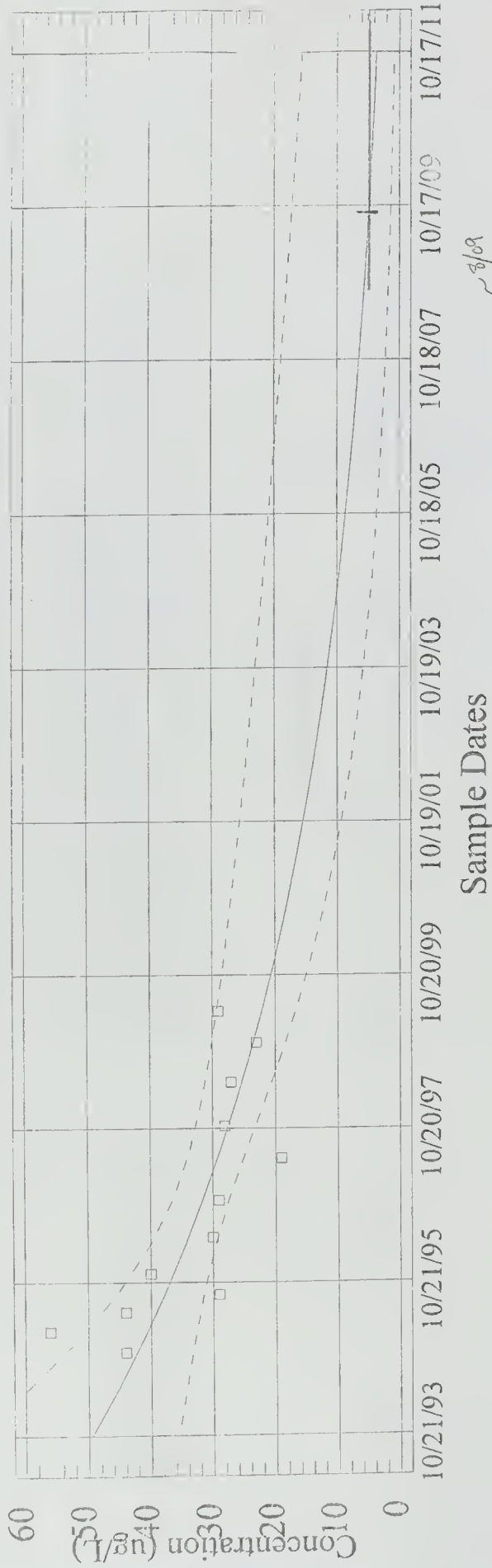
TRICHLOROETHENE  
CONCENTRATIONS  
FOR WELL L-88-10

LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

AutoCad FILE: PCEL8811.DWG

333

# PCE Concentrations L-88-10 (Truncated Data Set)



EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = -4.4  
% DECLINE OBSERVED = 86%

Solid line is the estimate of the mean concentration over time, statistically derived from the data collected to date.

Pair of dotted lines delineates the envelope containing the means of the data points at each point in time with a 95% degree of statistical confidence, i.e. the solid line described above could vary anywhere within this inner envelope.

Pre-1994 data was truncated from this plot because it appeared to be from a different regime & biased the best-fit mean to be below the latest data values.

ESTIMATED TIME FRAME FOR  
COMPLIANCE WITH MCL LEVEL  
2009

THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

TETRACHLOROETHENE  
CONCENTRATIONS  
FOR WELL L-88-10

Concentration (ug/L)

4/30/89	4/29/92	4/29/95	4/28/98	4/27/01	4/26/04	4/26/07	4/25/10	4/24/13	4/23/16
---------	---------	---------	---------	---------	---------	---------	---------	---------	---------

Sample Date

EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN  $\mu\text{g/L/YEAR} = -25$   
% DECLINE OBSERVED = 85%

Solid line is the estimate of the mean concentration over time, statistically derived from the data collected to date.

*Pair of dotted lines delineates the envelope containing the means of the data points at each point in time with a 95% degree of statistical confidence. I.E. the solid line described above could vary anywhere within this inner envelope.*

ESTIMATED TIME FRAME FOR COMPLIANCE WITH MCL LEVEL 2014

THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

WILSON, R. C.

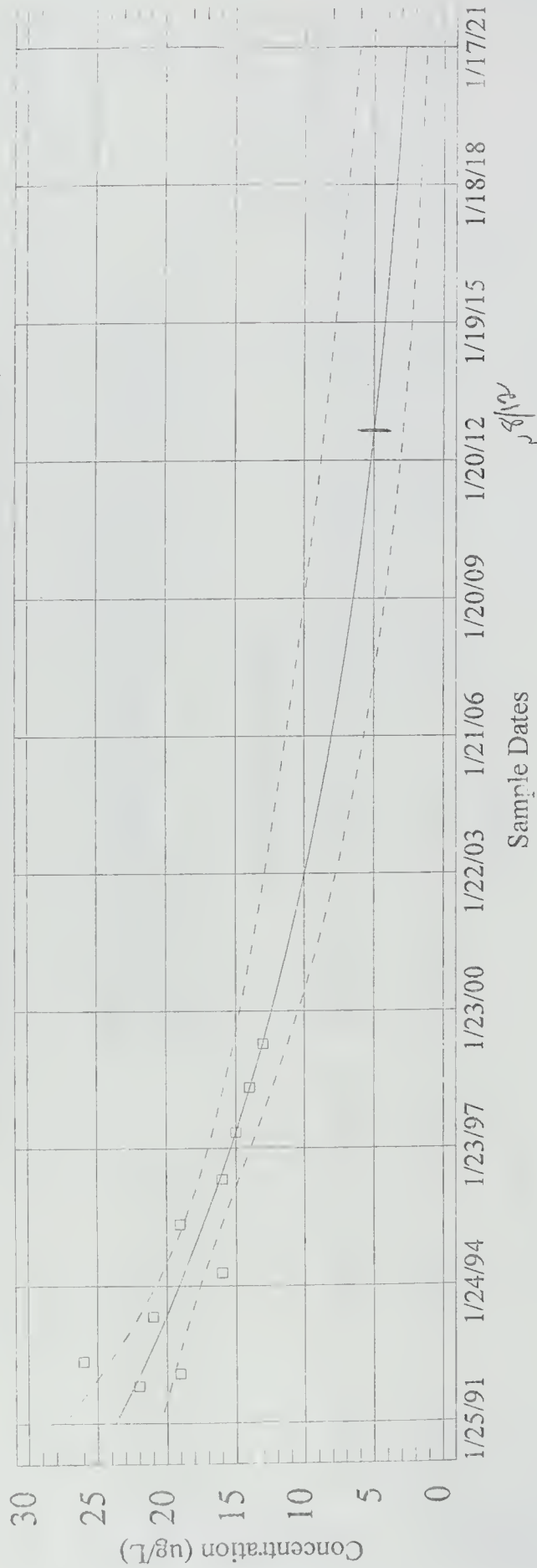
LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

TETRACHLOROETHENE  
CONCENTRATION  
FOR WELL 89-4

AutoCad FILE: PCEL8811.DWG

FIGURE 7-2

# PCE Concentrations L-88-13 (Truncated Data Set)



EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = -1.3  
% DECLINE OBSERVED = 85%

Solid line is the estimate of the mean concentration over time, statistically derived from the data collected to date.

Pair of dotted lines delineates the envelope containing the means of the data points at each point in time with a 95% degree of statistical confidence. I.E. the solid line described above could vary anywhere within this inner envelope.

Pre-1994 data was truncated from this plot because it appeared to be from a different regime & biased the best-fit mean to be below the latest data values.

ESTIMATED TIME FRAME FOR  
COMPLIANCE WITH MCL LEVEL  
2012

THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

TETRACHLOROETHENE  
CONCENTRATIONS  
FOR WELL L-88-13

ENVIROCON, INC.

# PCE Concentrations 92-4: Winter & Spring Data Plotted (Summer & Fall all <5ug/L)



## Sample Dates

EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = -1.5  
% DECLINE OBSERVED = 44%

Solid line is the estimate of the mean concentration over time, statistically derived from the data collected to date.

Pair of dotted lines delineates the envelope containing the means of the data points at each point in time with a 95% degree of statistical confidence. I.E. the solid line described above could vary anywhere within this inner envelope.

Summer & Fall data was not included in plot because it was all less than the MCL & biased the mean curve, falsely indicating that PCE concentrations would consistently drop below MCL sooner than the data indicates.

ESTIMATED TIME FRAME FOR  
COMPLIANCE WITH MCL LEVEL  
2029

THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

ENVIROCON, INC.

LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

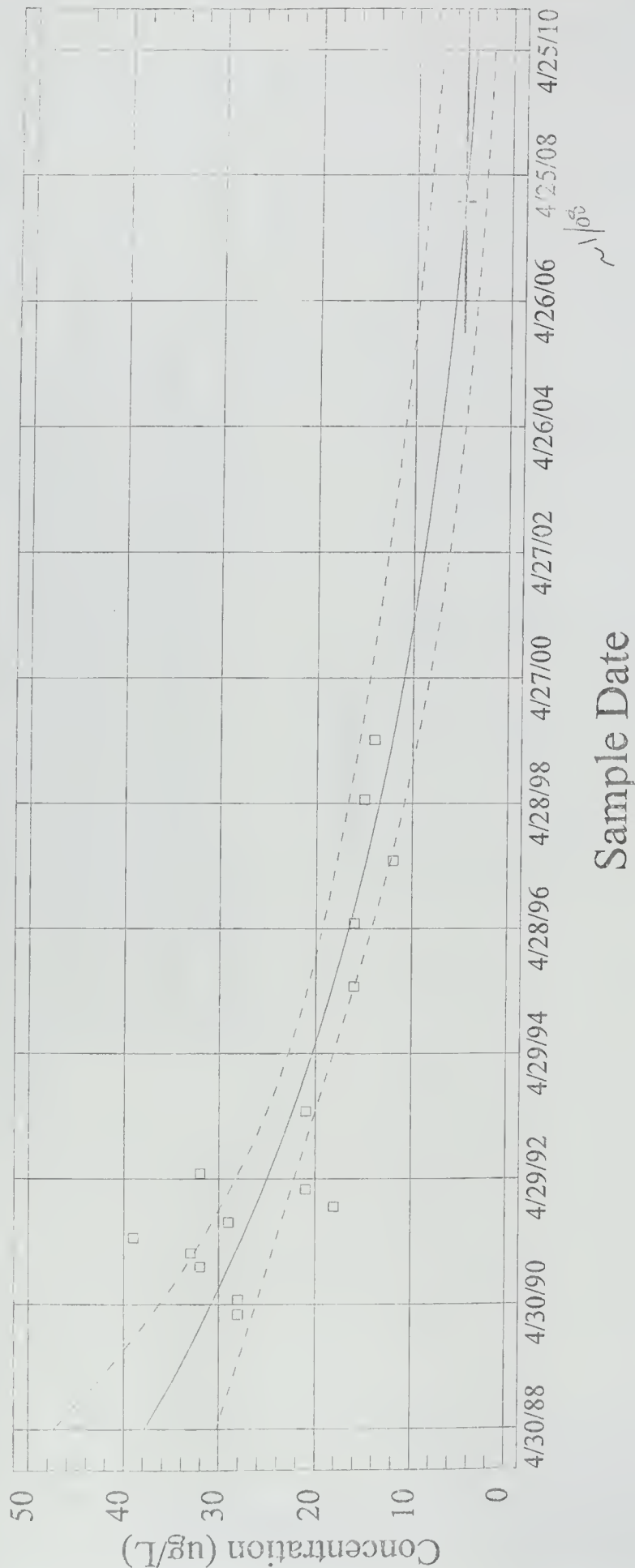
AutoCad FILE: PCEL8811.DWG

TETRACHLOROETHYLENE  
CONCENTRATIONS  
FOR WELL 92-4

FIGURE 12



# PCE Concentrations 89-6



EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = -2.1  
% DECLINE OBSERVED = 64%

Solid line is the estimate of the mean concentration over time, statistically derived from the data collected to date.

Pair of dotted lines delineates the envelope containing the means of the data points at each point in time with a 95% degree of statistical confidence. I.E. the solid line described above could vary anywhere within this inner envelope.

ESTIMATED TIME FRAME FOR  
COMPLIANCE WITH MCL LEVEL  
2008

THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

ENVIROCON, INC.

LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

AutoCad FILE: PCEL8811.DWG

TETRACHLOROETHENE  
CONCENTRATIONS  
FOR WELL 89-6

FIGURE 10.0

# PCE Concentrations 92-2



EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = -4.3  
% DECLINE OBSERVED = 69%

Solid line is the estimate of the mean concentration over time, statistically derived from the data collected to date.

Pair of dotted lines delineates the envelope containing the means of the data points at each point in time with a 95% degree of statistical confidence. I.E. the solid line described above could vary anywhere within this inner envelope.

ESTIMATED TIME FRAME FOR  
COMPLIANCE WITH MCL LEVEL  
6/2000

THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

ENVIROCON, INC.

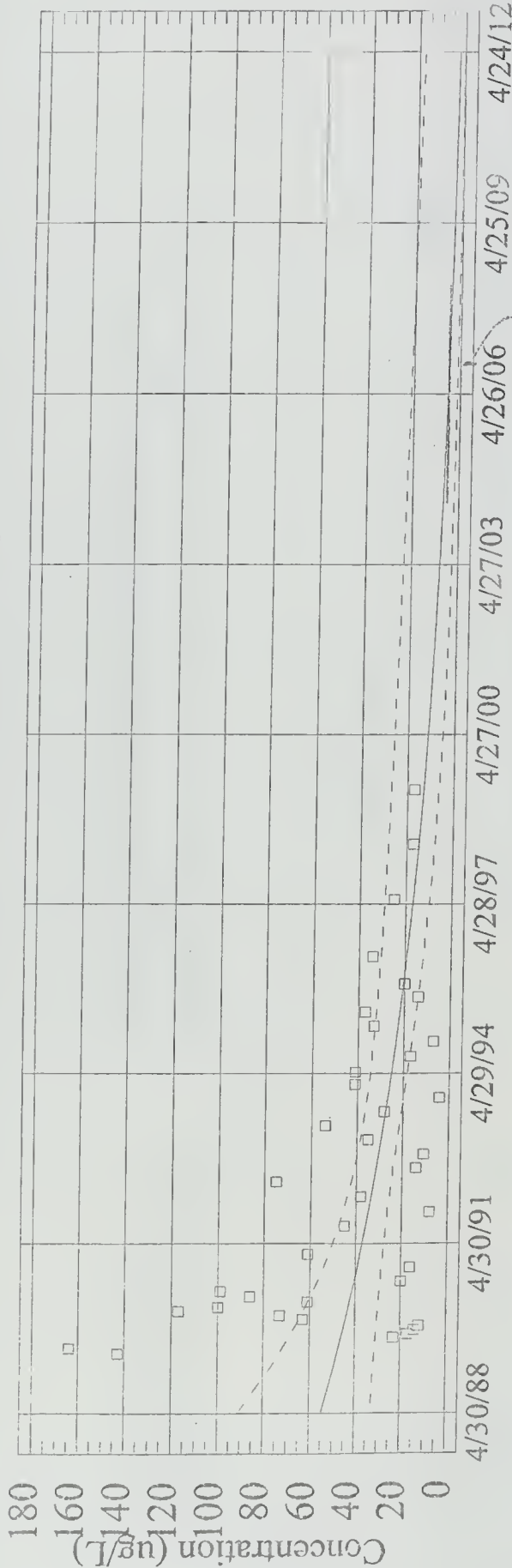
LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

AutoCad FILE: PCE18811.DWG

TETRACHLOROETHENE  
CONCENTRATIONS  
FOR WELL 92-2

7/2/97 11.0

# PCE Concentrations LS-11



~10/06

EXPONENTIAL REGRESSION LINE WITH  
95% CONFIDENCE INTERVAL ENVELOPE  
AVERAGE SLOPE IN ug/L/YEAR = -3.4  
% DECLINE OBSERVED = 89%

Solid line is the estimate of the mean concentration over time, statistically derived from the data collected to date.

Pair of dotted lines delineates the envelope containing the means of the data points at each point in time with a 95% degree of statistical confidence. I.E. the solid line described above could vary anywhere within this inner envelope.

ESTIMATED TIME FRAME FOR  
COMPLIANCE WITH MCL LEVEL  
2006

THE BURLINGTON NORTHERN &  
SANTA FE RAILWAY COMPANY

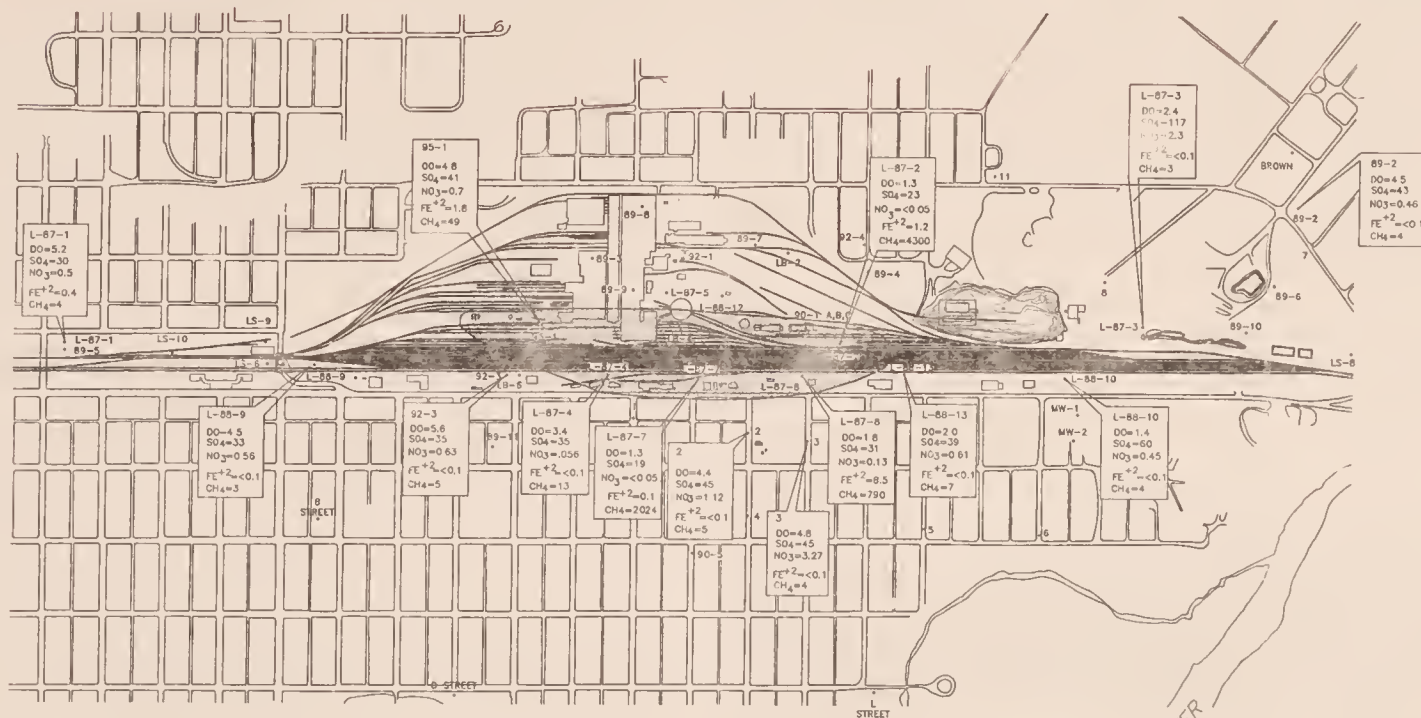
ENVIROCON, INC.

TETRACHLOROETHENE  
CONCENTRATIONS  
FOR WELL LS-11

LIVINGSTON RAIL YARD  
1999 ANNUAL  
GROUNDWATER REPORT

AutoCad FILE: PCEL0011.DWG

FIGURE 12.0



# SYMBOL LEGEND

- MONITOR, MUNICIPAL OR PRIVATE WELL
- DO=8.2 DISSOLVED OXYGEN CONCENTRATION IN mg/l
- SO<sub>4</sub>=42 SULFATE CONCENTRATION IN mg/l
- NO<sub>3</sub>=1.02 NITRATE CONCENTRATION IN mg/l
- FE<sup>2+</sup>=<0.1 FERROUS IRON CONCENTRATION IN mg/l
- CH<sub>4</sub>=2 METHANE CONCENTRATION IN ppm

APPROXIMATE AERIAL EXTENT OF FREE & RESIDUAL PRODUCT PLUME

800 0 800

SCALE IN FEET

BURLINGTON NORTHERN  
SANTA FE RAILROAD COMPANY

ENVIROCON, INC.

1999 ANNUAL  
GROUND WATER REPORT

Acad file: 140401/GWR-NAPR99

NATURAL ATTENUATION  
PARAMETER RESULTS  
MAY of 1999

11-08-99

FIGURE 1.3.0

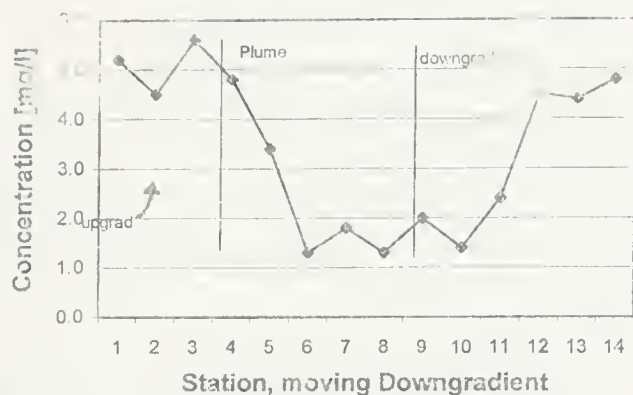




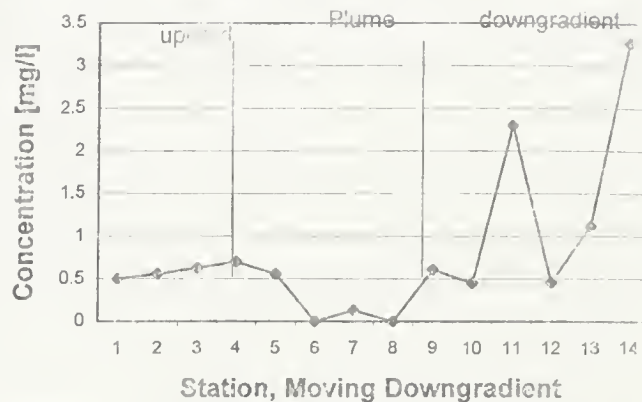
Figure 14.0  
Natural Attenuation Parameter (NAP) Results

Electron Donors  
(Consumed During HC Degradation)

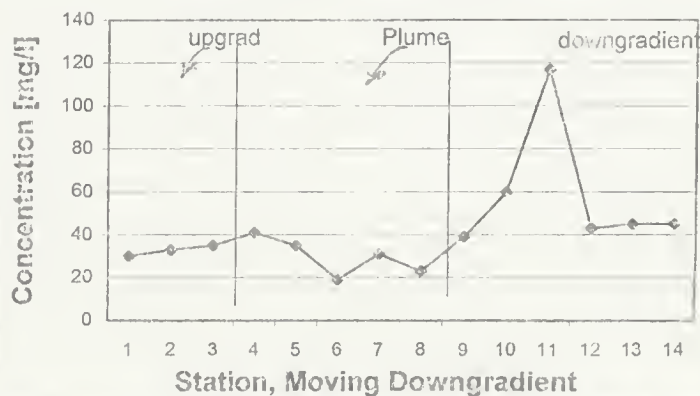
Dissolved Oxygen (DO) in Groundwater



Nitrate (NO3) in Groundwater



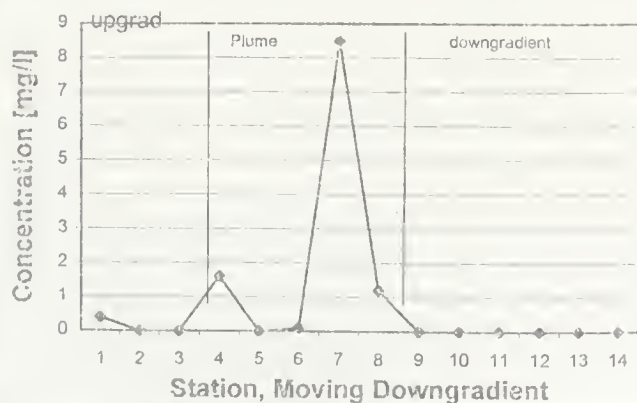
Sulfate (SO4) in Groundwater



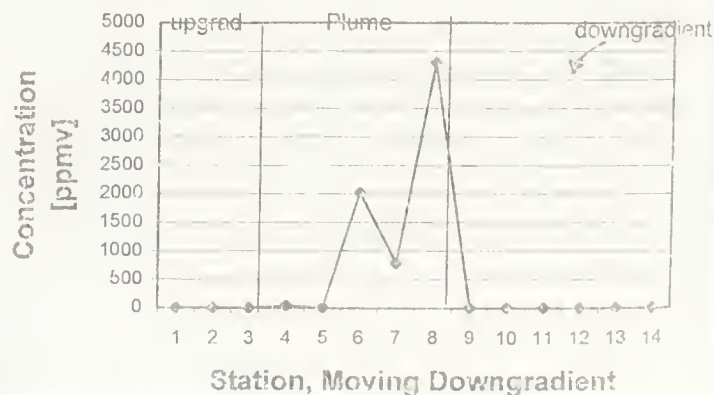
Degradation By-Products

(Produced During HC Degradation)

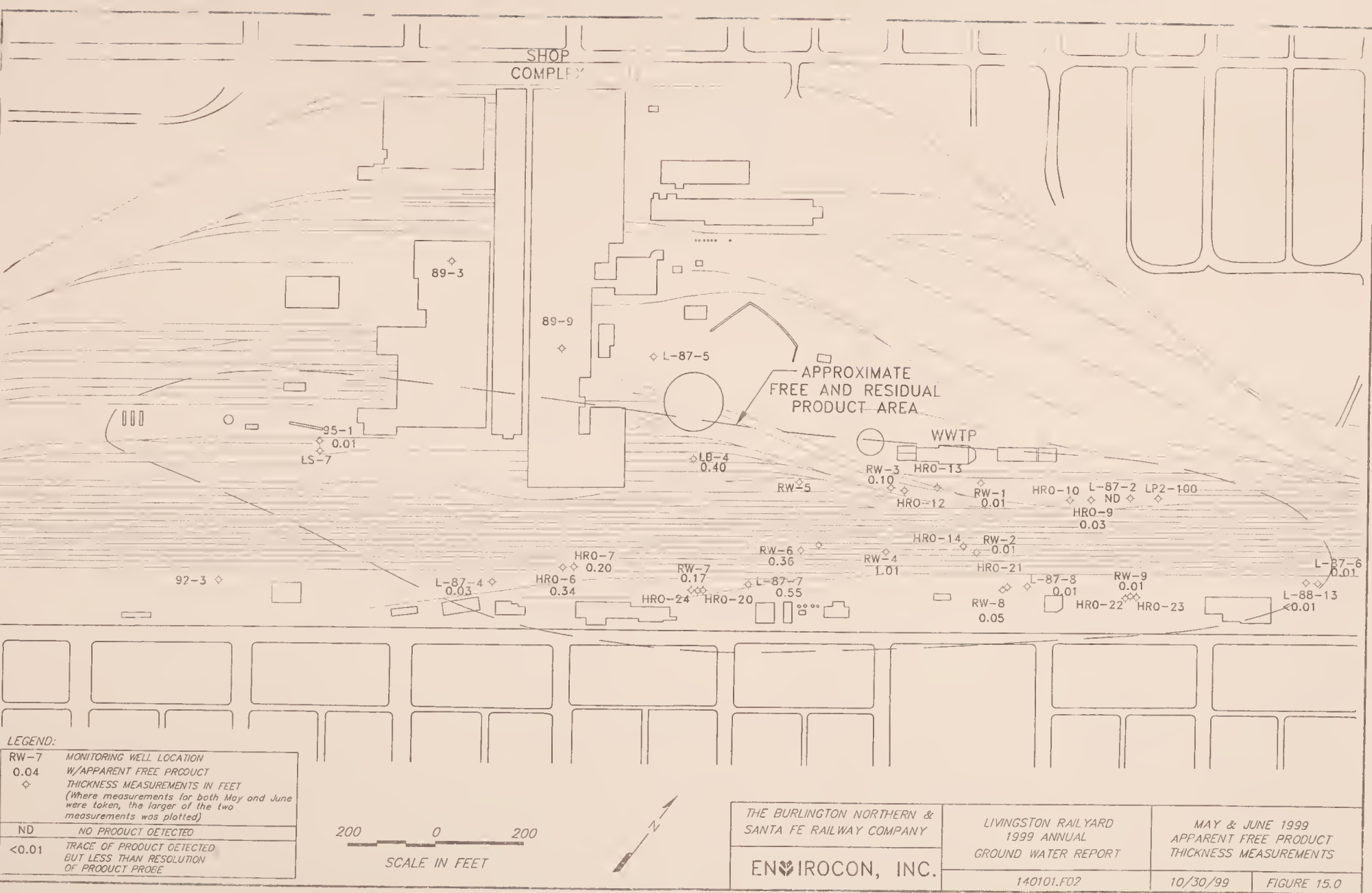
Ferrous Iron (Fe+2) in Groundwater



Methane (CH4) in Groundwater



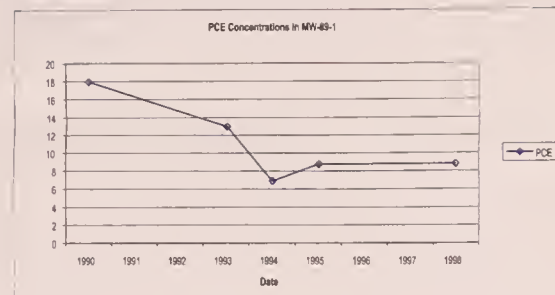






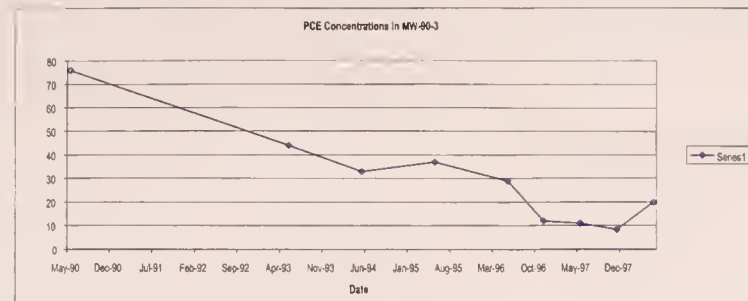
Monitoring Well 89-1

Sample Date	PCE
05/01/90	18
05/01/93	13
05/01/94	6.9
05/01/95	8.8
05/01/98	8.8



Monitoring Well 90-3

Sample Date	PCE
05/01/90	76
05/01/93	44
05/01/94	33
05/01/95	37
05/01/96	29
11/01/96	12
05/01/97	11
11/01/97	8.4
05/01/98	20

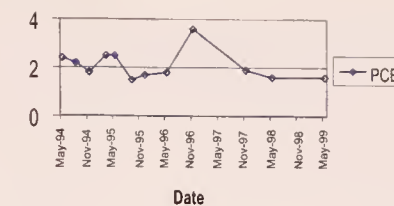


Monitoring Well 94-1

Sample Date	Sample No.	Tetrachloroethene (PCE)	Other VOCs
		[ppb]	by EPA Method 601
5/10/94	140101-1324	2.4	ND
8/23/94	140101-1351	2.2	ND
11/23/94	140101-1367	1.8	ND
3/2/95	140101-1392	2.5	ND
5/30/95	140101-1425	2.5	ND
9/6/95	140101-1472	1.5	ND
12/2/95	140101-1497	1.7	ND
5/21/96	140101-1508	1.8	ND
11/13/96	140101-1538	3.6	ND
11/14/97	140101-1601	1.9	ND
5/18/98	140101-1607	1.6	ND
5/6/99	140101-1676	1.6	ND

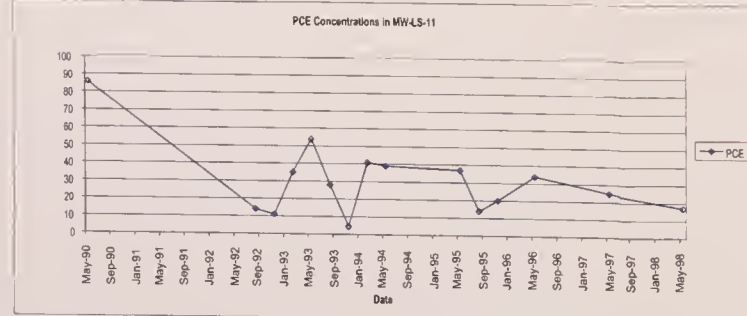
ND - not detected

MW 94-1 PCE Concentrations



Monitoring Well LS-11

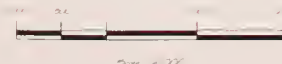
Sample Date	PCE
05/01/90	86
08/01/92	14
11/01/92	11
02/01/93	35
05/01/93	54
08/01/93	28
11/01/93	4.4
02/01/94	41
05/01/94	39
05/01/95	37
08/01/95	14
11/01/95	20
05/01/96	34
05/01/97	25
05/01/98	17



Plume Outline  
5.0ppb PCE

Monitoring Well Location  
PCE concentrations in PPB

4444 SWL Elevation Contour

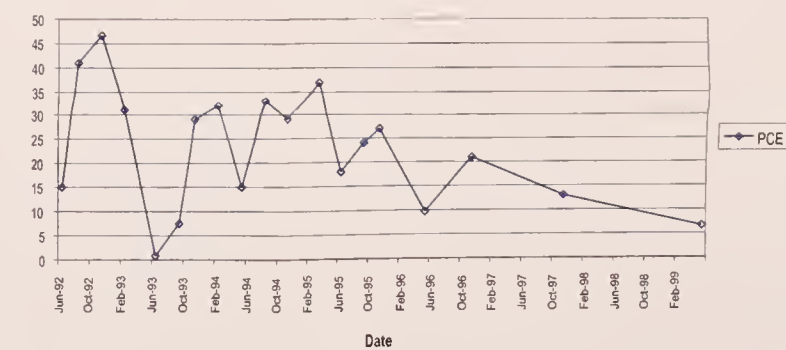


Monitoring Well 92-2

Sample Date	Sample No.	Tetrachloroethene (PCE)	cis-1,2-Dichloroethene (DCE)	Trichloroethene (TCE)	Chlorobenzene
		[ppb]	[ppb]	[ppb]	[ppb]
6/4/92	?	15	5.6	1	ND
8/28/92	?	41	18	8.4	ND
11/24/92	2751-MW-25	46.7	7.5	4.1	ND
2/25/93	140101-1176	31	4.2	2.3	ND
6/7/93	140101-1222	0.81	ND	ND	ND
9/2/93	140101-1238	7.5	ND	ND	ND
11/24/93	140101-1261	29	4.2	2.5	ND
2/18/94	140101-1271	32	3.6	3.3	ND
5/5/94	140101-1300	15	4.2	2	ND
8/19/94	140101-1345	33	6.4	ND	ND
11/22/94	140101-1363	29	2.6	2.4	0.84
3/1/95	140101-1386	37	3	2.4	ND
6/1/95	140101-1442	18	3.6	2.1	ND
9/5/95	140101-1468	24	6	3	ND
11/29/95	140101-1478	27	4.1	3.7	ND
5/21/96	140101-1509	9.7	0.74	0.67	ND
11/12/96	140101-1537	21	1.6	2	ND
11/10/97	140101-1583	13	0.92	1.2	ND
5/6/99	140101-1675	6.6	ND	ND	ND

ND - not detected

PCE Concentrations at MW 92-2



PREPARED FOR

BN-SF

PREPARED BY

ENVIROCON

500 TAYLOR STREET  
MISSOULA, MONTANA 59807

TITLE

Static Groundwater Elevations  
and Inferred Hydraulic Gradient  
in September 1999

SCALE As Noted

DRAWING No

140101/Well-Data-Fig16

PAGE

1 of 1

DRAWN BY

JNS

CHECKED BY

DM

DATE

11-04-99

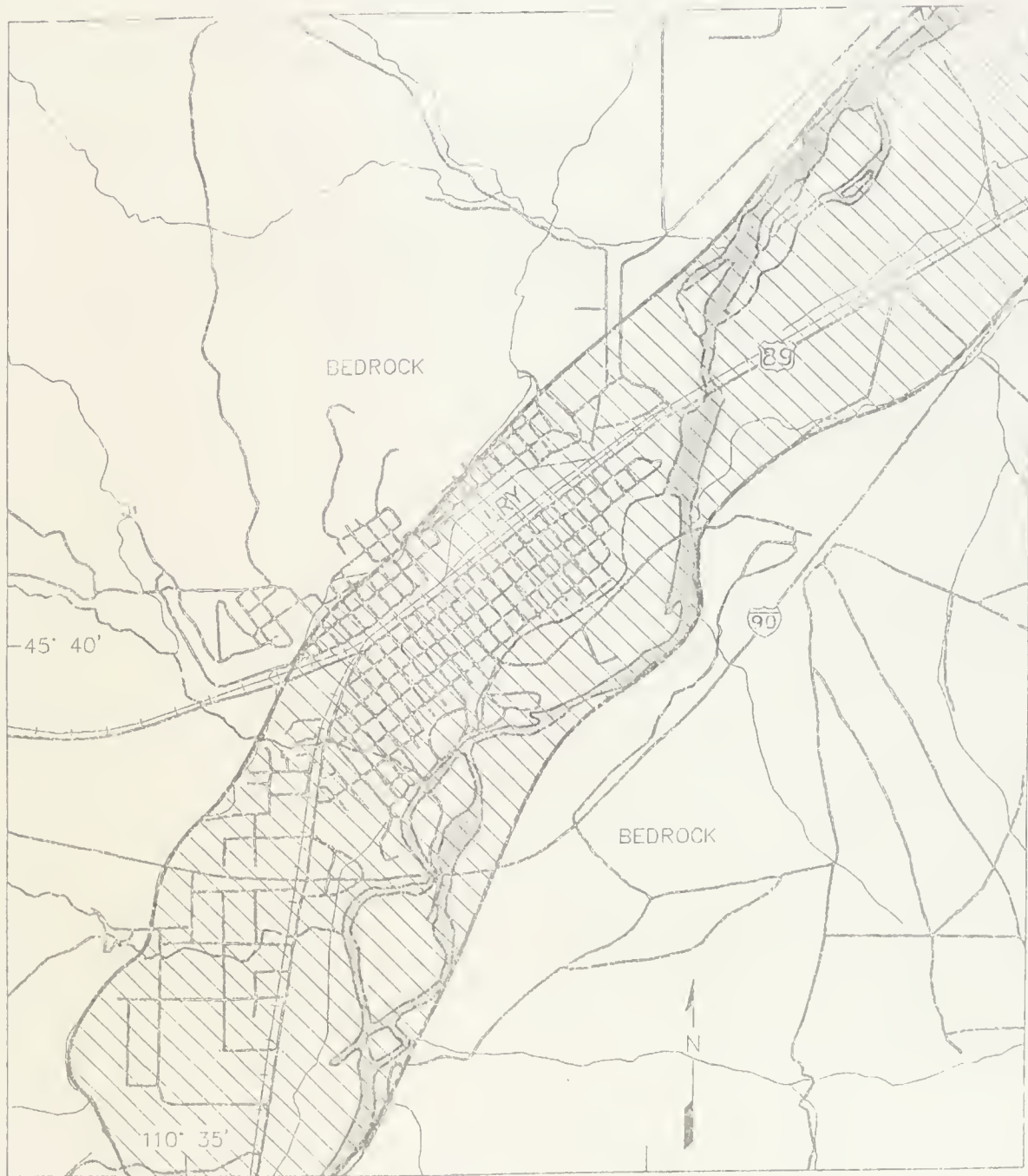
FIGURE

16





**QUALITY PARK**  
10 x 13



BURLINGTON NORTHERN

**ENVIROCON, INC.**

GROUND WATER SECTION  
LIVINGSTON RAIL YARD  
REMEDIAL INVESTIGATION

AutoCAD FILE: CWRI-1.DWG\_B

APPROXIMATE AREA  
OF  
LIVINGSTON AQUIFER

8/27/91

FIGURE 17.0



## **APPENDIX A**

### **LABORATORY ANALYTICAL RESULTS**





**DECEMBER 1998**

**BNSF GROUND WATER SAMPLE RESULTS**





# ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 14-DEC-98  
Date Received: 17-DEC-98  
Analysis Date: 25-DEC-1998 12:45  
File: /IONTRAP1.1/vb122498.b/37dec24.d  
Project Info:  
Sample Info: 140101-1637

Lab No.: 98-78709  
Report Date: 01/04/99 17:45  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>4.1</b>	
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.13	81	80--120
Toluene d8	10.0	9.99	100	80--120
p-Bromofluorobenzene	10.0	8.42	84	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 15-DEC-98  
Date Received: 17-DEC-98  
Analysis Date: 25-DEC-1998 09:48  
File: /IONTRAP1.i/vb122498.b/33dec24.d  
Project Info:  
Sample Info: 140101-1638

Lab No.: 98-78710  
Report Date: 01/04/99 15:32  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 624**  
**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>1.8</b>	
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.17	92	80--120
Toluene d8	10.0	9.19	92	80--120
p-Bromofluorobenzene	10.0	9.56	96	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: PAZReviewing Supervisor: mm



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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 16-DEC-98  
Date Received: 17-DEC-98  
Analysis Date: 25-DEC-1998 10:32  
File: /IONTRAP1.i/vbl22498.b/34dec24.d  
Project Info:  
Sample Info: 140101-1640

Lab No.: 98-78711  
Report Date: 01/04/99 16:14  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT =====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	3.3	
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	86	D
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	1.6	
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.20	82	80--120
Toluene d8	10.0	9.50	95	80--120
p-Bromofluorobenzene	10.0	8.97	90	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.  
D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: GA Reviewing Supervisor: Mon



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Client: Envirocon, Inc.

Date Sampled: 16-DEC-98

Date Received: 17-DEC-98

Analysis Date: 25-DEC-1998 11:13

File: /IONTRAP1.i/vb122498.b/35dec24.d

Project Info:

Sample Info: 140101-1641

Lab No.: 98-78712

Report Date: 01/04/99 15:34

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
<b>cis-1,2-Dichloroethene</b>	<b>156-59-2</b>	<b>1.0</b>	
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>18</b>	
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>1.9</b>	
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- SURROGATE RECOVERY REPORT -----				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.66	97	80--120
Toluene d8	10.0	9.36	94	80--120
p-Bromofluorobenzene	10.0	8.77	88	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: VPReviewing Supervisor: men







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Client: Envirocon, Inc.  
Date Sampled: 16-DEC-98  
Date Received: 17-DEC-98  
Analysis Date: 31-DEC-1998 23:31  
File: /IONTRAP1.i/vb123198.b/16dec31.d  
Project Info:  
Sample Info: 140101-1642

Lab No.: 98-78713dup  
Report Date: 01/04/99 17:54  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.11	81	80--120
Toluene d8	10.0	9.64	96	80--120
p-Bromofluorobenzene	10.0	9.89	99	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: AP

Reviewing Supervisor: mg

Quality Control Sample: Laboratory Reagent Blank 25-DEC-1998 03:27

Report Date: 01/04/99 15:19

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb122498.b/24dec24.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

# EPA METHOD 624

## VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.63	96	80--120
Toluene d8	10.0	9.53	95	80--120
p-Bromofluorobenzene	10.0	8.79	88	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:

# EPA METHOD 624 BLANK SPIKE REPORT

=====

Quality Control Sample: Reference Sample Analysis 25-DEC-1998 02:45

Report Date: 01/04/99 15:04

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb122498.b/23dec24.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Bromodichloromethane	5.00	4.88	98	60--140
Bromoform	5.00	5.53	111	60--140
Bromomethane	5.00	4.56	91	60--140
Carbon tetrachloride	5.00	4.49	90	60--140
Chlorobenzene	5.00	5.04	101	60--140
Chloroethane	5.00	4.61	92	60--140
2-Chloroethylvinyl ether	5.00	5.39	108	60--140
Chloroform	5.00	5.14	103	60--140
Chloromethane	5.00	5.10	102	60--140
2-Chlorotoluene	5.00	4.55	91	60--140
Chlorodibromomethane	5.00	5.12	102	60--140
1,2-Dichlorobenzene	5.00	5.23	105	60--140
1,3-Dichlorobenzene	5.00	4.64	93	60--140
1,4-Dichlorobenzene	5.00	4.88	98	60--140
Dichlorodifluoromethane	5.00	3.42	68	60--140
1,1-Dichloroethane	5.00	5.35	107	60--140
1,2-Dichloroethane	5.00	4.34	87	60--140
1,1-Dichloroethene	5.00	5.11	102	60--140
cis-1,2-Dichloroethene	5.00	4.95	99	60--140
trans-1,2-Dichloroethene	5.00	5.12	102	60--140
1,2-Dichloropropane	5.00	4.93	99	60--140
cis-1,3-Dichloropropene	5.00	4.90	98	60--140
trans-1,3-Dichloropropene	5.00	4.74	95	60--140
Methylene chloride	5.00	5.23	105	60--140
1,1,2,2-Tetrachloroethane	5.00	5.85	117	60--140
Tetrachloroethene	5.00	4.40	88	60--140
1,1,1-Trichloroethane	5.00	4.12	82	60--140
1,1,2-Trichloroethane	5.00	5.48	110	60--140
Trichloroethene	5.00	4.72	94	60--140
Trichlorofluoromethane	5.00	4.66	93	60--140
Vinyl chloride	5.00	5.60	112	60--140

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.30	83	80--120
Toluene d8	10.0	9.12	91	80--120
p-Bromofluorobenzene	10.0	9.27	93	80--120

REPORT COMMENTS: None

Analyst: VAP Reviewing Supervisor: mg

# EPA METHOD 624 MATRIX SPIKE REPORT

=====

Quality Control Sample: Matrix Spike Analysis 31-DEC-98 22:47

Lab No.: 98-78712

Report Date: 01/04/99 16:09

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb123198.b/15dec31.d

Remarks: These compounds were spiked into the sample matrix to determine if the sample matrix contributes bias to the analytical results and to monitor the accuracy of the methodology.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Spike Added	Sample Concentration	Matrix Spike Concentration	MS %Rec	QC Limits
Chlorobenzene	5.00	<1.00	5.33	107	60--140
1,1-Dichloroethene	5.00	<1.00	5.31	106	60--140
Trichloroethene	5.00	1.9	6.55	95	60--140

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
PO Box 16655  
Missoula, MT 59808

Lab No. : 98-78714 lms  
Date : 07-JAN-99

WATER ANALYSIS REPORT

Sample ID : 140101-1639  
Sample Date : 16-DEC-98  
Sample Time :  
Sample Received : 17-DEC-98

Constituents	Report	Results	Units	Re- marks	Method	- Analysis -		
	Limit					Date	Time	By
Sulfate	1	36	mg/l		300.0	21-DEC-98	2013	SKW
Nitrate plus Nitrite as N	0.05	0.20	mg/l		353.2	21-DEC-98	1440	BAS
Ferrous Iron	0.1	<0.1	mg/l		SM3500	17-DEC-98	1530	RLH
Methane, Headspace	1	3	ppm			18-DEC-98	0922	BDW

The volume of water in the methane vial was 36 ml. Analysis done by GC/FID.



Lab No(s). 98-78714 - 98-78714

### QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

Constituents	Duplicate Analysis		Spiked	----- Reference -----			Date Analyzed
	--- mg/l (ppm) ---		Analysis	Blank	Sample	Accept	
	Original	Duplicate	Recovery	mg/l ppm	mg/l ppm	Range	
Sulfate	952	963	99	<1	54	45-55	21-DEC-98
Nitrate plus Nitrite as N	<0.05	<0.05	107	<0.05	2.30	2.04-2.56	21-DEC-98
Ethane, Headspace	ppm N/A	N/A	N/A	<1	14	13-15	18-DEC-98
<u>Metals Analysis</u>							
Ferrous Iron	<0.1	<0.1	97	<0.1	2.3	1.7 - 2.3	17-DEC-98

Lab Nos.: 98-78709 - 98-78714

Date: 17-DEC-98

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form

Completed & Signed

Yes Comments: \_\_\_\_\_

Chain of Custody Seal

Yes Comments: \_\_\_\_\_

Intact

Yes Comments: \_\_\_\_\_

Signature Match Chain of Custody vs. Seal

Yes Comments: \_\_\_\_\_

Samples Received Cold

Yes Comments: \_\_\_\_\_

Samples Received Within Holding Time

Yes Comments: \_\_\_\_\_

Samples Received in Proper Containers

Yes Comments: \_\_\_\_\_

Samples Received Properly Preserved

Yes Comments: \_\_\_\_\_

**Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.**

Client notified about sample discrepancies:

Who: \_\_\_\_\_

By: \_\_\_\_\_

Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 130 359 689 9

Additional comments: \_\_\_\_\_

12/16/98

81023  
76827

Sampler: Mike McKinsey  
Envirocon  
500 Taylor  
Missoula, MT 59801  
406-523-1167

Date	Sample Number	Volume	601	NO <sub>3</sub>	SO <sub>4</sub>	Methane	Ferrous Iron	SLI Lab #
12/14/98	140101 - 1637	2-40ml	X					98-78709
12/15/98	140101 - 1638	2-40ml	X					10
12/16/98	140101 - 1638	3-250ml 1-40ml		X	X	X	X	14
2/16/98	140101 - 1640	2-40ml	X					11
2/16/98	140101 - 1641	2-40ml	X					12
2/16/98	140101 - 1642	2-40ml	X					13

Relin. by: Mahad McKinsey

12/16/98 1440

Loc'd by: Sandra Beckwith  
12/17/98 0830

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 16-DEC-98  
Date Received: 18-DEC-98  
Analysis Date: 25-DEC-1998 04:09  
File: /IONTRAP1.i/vbl22498.b/25dec24.d  
Project Info:  
Sample Info: 140101-1643

Lab No.: 98-78895  
Report Date: 01/04/99 16:29  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>2.4</b>	
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.34	83	80--120
Toluene d8	10.0	9.56	96	80--120
p-Bromofluorobenzene	10.0	9.35	94	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HAZ      Reviewing Supervisor: mm



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Client: Envirocon, Inc.  
Date Sampled: 16-DEC-98  
Date Received: 18-DEC-98  
Analysis Date: 25-DEC-1998 04:51  
File: /IONTRAP1.i/vb122498.b/26dec24.d  
Project Info:  
Sample Info: 140101-1644

Lab No.: 98-78896  
Report Date: 01/04/99 15:21  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	1.9	
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	47	D
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	3.0	
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.58	96	80--120
Toluene d8	10.0	9.21	92	80--120
p-Bromofluorobenzene	10.0	8.96	90	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.  
D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: RAZ Reviewing Supervisor: nm





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Client: Envirocon, Inc.  
Date Sampled: 17-DEC-98  
Date Received: 18-DEC-98  
Analysis Date: 25-DEC-1998 05:33  
File: /IONTRAP1.i/vb122498.b/27dec24.d  
Project Info:  
Sample Info: 140101-1645

Lab No.: 98-78897  
Report Date: 01/04/99 17:22  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.60	96	80--120
Toluene d8	10.0	9.53	95	80--120
p-Bromofluorobenzene	10.0	8.95	89	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: AP

Reviewing Supervisor: mm



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Client: Envirocon, Inc.  
Date Sampled: 17-DEC-98  
Date Received: 18-DEC-98  
Analysis Date: 25-DEC-1998 06:17  
File: /IONTRAP1.i/vb122498.b/28dec24.d  
Project Info:  
Sample Info: 140101-1646

Lab No.: 98-78898  
Report Date: 01/04/99 17:23  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 624**  
**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	4.6	
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	60	D
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.19	82	80--120
Toluene d8	10.0	9.66	97	80--120
p-Bromofluorobenzene	10.0	9.11	91	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: AP Reviewing Supervisor: mm



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Client: Envirocon, Inc.  
Date Sampled: 17-DEC-98  
Date Received: 18-DEC-98  
Analysis Date: 25-DEC-1998 06:58  
File: /IONTRAP1.i/vb122498.b/29dec24.d  
Project Info:  
Sample Info: 140101-1647

Lab No.: 98-78899  
Report Date: 01/04/99 17:24  
Extraction Method: EPA 5030  
Sample Matrix: WATER, pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT =====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
<b>Chlorobenzene</b>	<b>108-90-7</b>	<b>6.4</b>	
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
<b>cis-1,2-Dichloroethene</b>	<b>156-59-2</b>	<b>18</b>	
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>23</b>	<b>D</b>
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>9.5</b>	
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	1.7	

### ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.78	98	80--120
Toluene d8	10.0	9.36	94	80--120
p-Bromofluorobenzene	10.0	8.95	89	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.  
D= Value was derived from a 5 times dilution.

REPORT COMMENTS: None

Analyst:   *GP*  

Reviewing Supervisor:   *MB*

Quality Control Sample: Laboratory Reagent Blank 25-DEC-1998 03:27

Report Date: 01/04/99 15:19

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb122498.b/24dec24.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.63	96	80--120
Toluene d8	10.0	9.53	95	80--120
p-Bromofluorobenzene	10.0	8.79	88	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: RPZ Reviewing Supervisor: mm

# EPA METHOD 624 BLANK SPIKE REPORT

=====

Quality Control Sample: Reference Sample Analysis 25-DEC-1998 02:45

Report Date: 01/04/99 15:04

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb122498.b/23dec24.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)				
Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Bromodichloromethane	5.00	4.88	98	60--140
Bromoform	5.00	5.53	111	60--140
Bromomethane	5.00	4.56	91	60--140
Carbon tetrachloride	5.00	4.49	90	60--140
Chlorobenzene	5.00	5.04	101	60--140
Chloroethane	5.00	4.61	92	60--140
2-Chloroethylvinyl ether	5.00	5.39	108	60--140
Chloroform	5.00	5.14	103	60--140
Chloromethane	5.00	5.10	102	60--140
2-Chlorotoluene	5.00	4.55	91	60--140
Chlorodibromomethane	5.00	5.12	102	60--140
1,2-Dichlorobenzene	5.00	5.23	105	60--140
1,3-Dichlorobenzene	5.00	4.64	93	60--140
1,4-Dichlorobenzene	5.00	4.88	98	60--140
Dichlorodifluoromethane	5.00	3.42	68	60--140
1,1-Dichloroethane	5.00	5.35	107	60--140
1,2-Dichloroethane	5.00	4.34	87	60--140
1,1-Dichloroethene	5.00	5.11	102	60--140
cis-1,2-Dichloroethene	5.00	4.95	99	60--140
trans-1,2-Dichloroethene	5.00	5.12	102	60--140
1,2-Dichloropropane	5.00	4.93	99	60--140
cis-1,3-Dichloropropene	5.00	4.90	98	60--140
trans-1,3-Dichloropropene	5.00	4.74	95	60--140
Methylene chloride	5.00	5.23	105	60--140
1,1,2,2-Tetrachloroethane	5.00	5.85	117	60--140
Tetrachloroethene	5.00	4.40	88	60--140
1,1,1-Trichloroethane	5.00	4.12	82	60--140
1,1,2-Trichloroethane	5.00	5.48	110	60--140
Trichloroethene	5.00	4.72	94	60--140
Trichlorofluoromethane	5.00	4.66	93	60--140
Vinyl chloride	5.00	5.60	112	60--140

----- SURROGATE RECOVERY REPORT -----				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.30	83	80--120
Toluene d8	10.0	9.12	91	80--120
p-Bromofluorobenzene	10.0	9.27	93	80--120

REPORT COMMENTS: None

Analyst: RAZ      Reviewing Supervisor: my



# EPA METHOD 624 MATRIX SPIKE REPORT

=====

Quality Control Sample: Matrix Spike Analysis 31-DEC-98 22:47

Lab No.: 98-78712

Report Date: 01/04/99 16:09

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb123198.b/15dec31.d

Remarks: These compounds were spiked into the sample matrix to determine if the sample matrix contributes bias to the analytical results and to monitor the accuracy of the methodology.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Spike Added	Sample Concentration	Matrix Spike Concentration	MS %Rec	QC Limits
=====	=====	=====	=====	=====	=====
Chlorobenzene	5.00	<1.00	5.33	107	60--140
1,1-Dichloroethene	5.00	<1.00	5.31	106	60--140
Trichloroethene	5.00	1.9	6.55	95	60--140

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
PO Box 16655  
Missoula, MT 59808

Lab No. : 98-78899 lms  
Date : 08-JAN-99

WATER ANALYSIS REPORT

Sample ID : 140101-1647  
Sample Date : 17-DEC-98  
Sample Time :  
Sample Received : 18-DEC-98

Constituents	Report	Results	Units	Re- marks	Method	- -Analysis- -		
	Limit					Date	Time	By
Sulfate	1	60	mg/l		300.0	24-DEC-98	0828	SKW
Nitrate plus Nitrite as N	0.05	0.07	mg/l		353.2	21-DEC-98	1606	BAS
Ferrous Iron	0.1	<0.1	mg/l		SM3500	18-DEC-98	0945	FMB
Methane, Headspace	1	11	ppm		GC/FID	18-DEC-98	1002	BDW

The total volume of water in the methane vial was 34 ml.



Lab No(s) . 98-78899 - 98-78899

### QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

Constituents	Duplicate Analysis		Spiked	----- Reference -----			Date Analyzed
	--- mg/l (ppm) ---		Analysis	Blank	Sample	Accept	
			%	Analysis,	Analysis,	Range	
	Original	Duplicate	Recovery	mg/l ppm	mg/l ppm	mg/l ppm	
Sulfate	5	5	99	<1	51	45-55	24-DEC-98
Nitrate plus Nitrite as N	0.06	0.06	98	<0.05	2.30	2.04-2.56	21-DEC-98
Ethane, Headspace	ppm N/A	N/A	N/A	<1	14	13-15	18-DEC-98
<u>Metals Analysis</u>							
Ferrous Iron	<0.1	<0.1	112	<0.1	2.2	1.8 - 2.2	18-DEC-98

Lab Nos.: 98-78895 - 98-78899

Date: 18-DEC-98

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form

Completed & Signed

Yes Comments: \_\_\_\_\_

Chain of Custody Seal

No Comments: \_\_\_\_\_

Intact

N/A Comments: \_\_\_\_\_

Signature Match Chain of Custody vs. Seal

N/A Comments: \_\_\_\_\_

Samples Received Cold

Yes Comments: \_\_\_\_\_

Samples Received Within Holding Time

Yes Comments: \_\_\_\_\_

Samples Received in Proper Containers

Yes Comments: \_\_\_\_\_

Samples Received Properly Preserved

Yes Comments: \_\_\_\_\_

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 130359 706 4

Additional comments: \_\_\_\_\_

E1023M

76899

Envirocon

12/17/98

500 Taylor St

Missoula, MT 59801

(406) 523-1167

Sampler: Mike McKinsey

<u>Date</u>	<u>Sample Number</u>	<u>Volume</u>	<u>601</u>	<u>Nitrate</u>	<u>Sulfate</u>	<u>Methane</u>	<u>Ferrus Iron</u>	<u>SLT Lab #</u>
12/16/98	140101-1643	2-40ml	X					98-78895
1/16/98	140101-1644	2-40ml	X					96
12/17/98	140101-1645	2-40ml	X					97
1/17/98	140101-1646	2-40ml	X					98
1/17/98	140101-1647	2-40ml 3-250ml 1-40ml	X	X	X	X	X	99

Relin. by Michael McKinsey  
12/17/98 1531

Sec'd by: Linda Hochstein  
12/18/98 @ 0720



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January 11, 1999

Michael McKinsey  
Envirocon, Inc.  
P.O. Box 16655  
Missoula, MT 59808

Dear Michael:

On December 18, 1998, these samples, represented by our laboratory numbers 98-78895 through 98-78899, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: \_\_\_\_\_

A handwritten signature in black ink, appearing to read "J. S. Shuler", is written over a horizontal line that serves as a signature line.

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Client: Envirocon, Inc.  
Date Sampled: 17-DEC-98  
Date Received: 22-DEC-98  
Analysis Date: 31-DEC-1998 14:14  
File: /IONTRAP1.i/vb123198.b/04dec31.d  
Project Info: LRY  
Sample Info: 140101-1648

Lab No.: 98-79081  
Report Date: 01/04/99 17:29  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
<b>Chlorobenzene</b>	<b>108-90-7</b>	<b>37</b>	<b>D</b>
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
<b>2-Chlorotoluene</b>	<b>95-49-8</b>	<b>45</b>	<b>D</b>
Chlorodibromomethane	124-48-1	<1.0	U
<b>1,2-Dichlorobenzene</b>	<b>95-50-1</b>	<b>2.0</b>	
1,3-Dichlorobenzene	541-73-1	<1.0	U
<b>1,4-Dichlorobenzene</b>	<b>106-46-7</b>	<b>4.0</b>	
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
<b>cis-1,2-Dichloroethene</b>	<b>156-59-2</b>	<b>33</b>	<b>D</b>
<b>trans-1,2-Dichloroethene</b>	<b>156-60-5</b>	<b>1.6</b>	
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>1.5</b>	
Trichlorofluoromethane	75-69-4	<1.0	U
<b>Vinyl chloride</b>	<b>75-01-4</b>	<b>38</b>	<b>D</b>

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.61	86	80--120
Toluene d8	10.0	9.08	91	80--120
p-Bromofluorobenzene	10.0	8.96	90	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: AK Reviewing Supervisor: MD



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Client: Envirocon, Inc.  
Date Sampled: 17-DEC-98  
Date Received: 22-DEC-98  
Analysis Date: 25-DEC-1998 07:40  
File: /IONTRAP1.i/vb122498.b/30dec24.d  
Project Info: LRY  
Sample Info: 140101-1649

Lab No.: 98-79082  
Report Date: 01/04/99 15:29  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 624**  
**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	1.8	
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	48	D
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	3.0	
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.12	81	80--120
Toluene d8	10.0	9.10	91	80--120
p-Bromofluorobenzene	10.0	8.43	84	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst:   *AP*  Reviewing Supervisor:   *MB*

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Client: Envirocon, Inc.  
Date Sampled: 17-DEC-98  
Date Received: 22-DEC-98  
Analysis Date: 25-DEC-1998 08:25  
File: /IONTRAP1.i/vb122498.b/31dec24.d  
Project Info: LRY  
Sample Info: 140101-1650

Lab No.: 98-79083  
Report Date: 01/04/99 16:17  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 624**  
**VOLATILE ORGANICS ANALYSIS REPORT**  
=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	1.8	
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	49	D
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	3.1	
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- **SURROGATE RECOVERY REPORT** -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.13	81	80--120
Toluene d8	10.0	9.50	95	80--120
p-Bromofluorobenzene	10.0	9.29	93	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.  
D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: VP Reviewing Supervisor: MD



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Client: Envirocon, Inc.  
Date Sampled: 17-DEC-98  
Date Received: 22-DEC-98  
Analysis Date: 25-DEC-1998 09:06  
File: /IONTRAP1.i/vb122498.b/32dec24.d  
Project Info: LRY  
Sample Info: 140101-1651

Lab No.: 98-79084  
Report Date: 01/04/99 15:31  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
<b>Tetrachloroethene</b>	<b>127-18-4</b>	<b>111</b>	<b>D</b>
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
<b>Trichloroethene</b>	<b>79-01-6</b>	<b>1.4</b>	
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.64	96	80--120
Toluene d8	10.0	9.22	92	80--120
p-Bromofluorobenzene	10.0	9.63	96	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.  
D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: NAZ

Reviewing Supervisor: MMJ

Quality Control Sample: Laboratory Reagent Blank 25-DEC-1998 03:27

Report Date: 01/04/99 15:19

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb122498.b/24dec24.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.63	96	80--120
Toluene d8	10.0	9.53	95	80--120
p-Bromofluorobenzene	10.0	8.79	88	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: MM Reviewing Supervisor: MM



Quality Control Sample: Laboratory Reagent Blank 31-DEC-1998 13:29

Report Date: 01/04/99 16:22

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb123198.b/03dec31.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Methylene chloride	75-09-2	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.17	92	80--120
Toluene d8	10.0	9.76	98	80--120
p-Bromofluorobenzene	10.0	8.29	83	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: RAZ

Reviewing Supervisor: MM



# EPA METHOD 624 BLANK SPIKE REPORT

Quality Control Sample: Reference Sample Analysis 25-DEC-1998 02:45

Report Date: 01/04/99 15:04

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb122498.b/23dec24.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Bromodichloromethane	5.00	4.88	98	60--140
Bromoform	5.00	5.53	111	60--140
Bromomethane	5.00	4.56	91	60--140
Carbon tetrachloride	5.00	4.49	90	60--140
Chlorobenzene	5.00	5.04	101	60--140
Chloroethane	5.00	4.61	92	60--140
2-Chloroethylvinyl ether	5.00	5.39	108	60--140
Chloroform	5.00	5.14	103	60--140
Chloromethane	5.00	5.10	102	60--140
2-Chlorotoluene	5.00	4.55	91	60--140
Chlorodibromomethane	5.00	5.12	102	60--140
1,2-Dichlorobenzene	5.00	5.23	105	60--140
1,3-Dichlorobenzene	5.00	4.64	93	60--140
1,4-Dichlorobenzene	5.00	4.88	98	60--140
Dichlorodifluoromethane	5.00	3.42	68	60--140
1,1-Dichloroethane	5.00	5.35	107	60--140
1,2-Dichloroethane	5.00	4.34	87	60--140
1,1-Dichloroethene	5.00	5.11	102	60--140
cis-1,2-Dichloroethene	5.00	4.95	99	60--140
trans-1,2-Dichloroethene	5.00	5.12	102	60--140
1,2-Dichloropropane	5.00	4.93	99	60--140
cis-1,3-Dichloropropene	5.00	4.90	98	60--140
trans-1,3-Dichloropropene	5.00	4.74	95	60--140
Methylene chloride	5.00	5.23	105	60--140
1,1,2,2-Tetrachloroethane	5.00	5.85	117	60--140
Tetrachloroethene	5.00	4.40	88	60--140
1,1,1-Trichloroethane	5.00	4.12	82	60--140
1,1,2-Trichloroethane	5.00	5.48	110	60--140
Trichloroethene	5.00	4.72	94	60--140
Trichlorofluoromethane	5.00	4.66	93	60--140
Vinyl chloride	5.00	5.60	112	60--140

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.30	83	80--120
Toluene d8	10.0	9.12	91	80--120
p-Bromofluorobenzene	10.0	9.27	93	80--120

REPORT COMMENTS: None

Analyst: HP

Reviewing Supervisor: MB

# EPA METHOD 624 MATRIX SPIKE REPORT

=====

Quality Control Sample: Matrix Spike Analysis 31-DEC-98 22:47

Lab No.: 98-78712

Report Date: 01/04/99 16:09

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb123198.b/15dec31.d

Remarks: These compounds were spiked into the sample matrix to determine if the sample matrix contributes bias to the analytical results and to monitor the accuracy of the methodology.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Spike Added	Sample Concentration	Matrix Spike Concentration	MS %Rec	QC Limits
Chlorobenzene	5.00	<1.00	5.33	107	60--140
1,1-Dichloroethene	5.00	<1.00	5.31	106	60--140
Trichloroethene	5.00	1.9	6.55	95	60--140



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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : Mike McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 98-79081A fs  
Date : 1/08/99

### GENERAL INFORMATION:

Laboratory No. : 98-79081A  
Sample Type : WATER  
Sample Point : 140101-1648  
Sample Date : 12/17/98  
Sample Time :  
Sample Received : 12/22/98

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	20	12/28/98
Nitrate plus Nitrite as N.....(mg/l).....	<0.05	12/23/98
Ferrous Iron.....(mg/l).....	1.3	12/22/98
Methane in headspace.....(ppm).....	5150 (1)	12/22/98

(1) The total volume of water in the vial was 33 ml.

Lab No(s). 98-79081 - 98-79081

### QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

Constituents	Duplicate Analysis		Spiked	----- Reference -----			Date Analyzed
	Analysis		Analysis	Blank	Sample	Accept	
	--- mg/l (ppm) ---		%	Analysis,	Analysis,	Range	
	Original	Duplicate	Recovery	mg/l ppm	mg/l ppm	mg/l ppm	
Sulfate	12	14	101	<1	49	45-55	28-DEC-98
Nitrate plus Nitrite as N	17.5	17.6	103	<0.05	2.36	2.04-2.56	23-DEC-98
Methane, Headspace	ppm N/A	N/A	N/A	<1	14	13-15	22-DEC-98
<u>Metals Analysis</u>							
Ferrous Iron	1.3	1.3	100	<0.1	2.0	1.8 - 2.2	22-DEC-98

Lab Nos.: 98-79081 - 98-79084

Date: 22-DEC-98

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal Intact	<u>Yes</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>Yes</u>	Comments: _____
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>No</u>	Comments: <u>Ferrous Iron rec'd past holding time.</u>
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>Yes</u>	Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 649 8

Additional comments: \_\_\_\_\_



	Split Samples: <input type="checkbox"/> Accepted <input type="checkbox"/> Declined	Signature _____
--	---	-----------------



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January 8, 1998

Michael McKinsey  
Envirocon, Inc.  
P.O. Box 16655  
Missoula, MT 59808

Dear Michael:

On December 22, 1998, these samples, represented by our laboratory numbers 98-79081 through 98-79084, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: \_\_\_\_\_

A handwritten signature in dark ink, appearing to read "A. Stedman", written over a horizontal line.



**MAY 1999**

**BNSF GROUND WATER SAMPLE RESULTS**







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Client: Envirocon, Inc.

Date Sampled: 03-MAY-99 00:00

Date Received: 05-MAY-99

Analysis Date: 14-MAY-1999 11:09

File: /chem/IONTRAP1.i/vb051499524.b/05may14.d

Project Info: PROJ. #140101, LIVINGSTON RAIL YARD

Sample Info: 140101-1652

Lab No.: 001-99-52195

Report Date: 05/17/99 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	14	
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	0.20J
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.04	80	80--120
Toluene d8	10.0	9.12	91	80--120
p-Bromofluorobenzene	10.0	9.59	96	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: THC Reviewing Supervisor: MD

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Client: Envirocon, Inc.

Date Sampled: 03-MAY-99 00:00

Date Received: 05-MAY-99

Analysis Date: 14-MAY-1999 11:48

File: /chem/IONTRAP1.i/vb051499524.b/06may14.d

Project Info: PROJ. #140101, LIVINGSTON RAIL YARD

Sample Info: 140101-1653

Lab No.: 002-99-52195

Report Date: 05/17/99 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	3.4	
trans-1,2-Dichloroethene	156-60-5	<0.50	0.25J
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	36	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	3.6	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.81	88	80--120
Toluene d8	10.0	8.96	90	80--120
p-Bromofluorobenzene	10.0	8.98	90	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJCReviewing Supervisor: AM



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Client: Envirocon, Inc.

Date Sampled: 03-MAY-99 00:00

Date Received: 05-MAY-99

Analysis Date: 14-MAY-1999 12:32

File: /chem/IONTRAP1.i/vb051499524.b/07may14.d

Project Info: PROJ. #140101, LIVINGSTON RAIL YARD

Sample Info: 140101-1654

Lab No.: 003-99-52195

Report Date: 05/17/99 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	1.4	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	80	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	1.2	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrchloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.02	90	80--120
Toluene d8	10.0	9.11	91	80--120
p-Bromofluorobenzene	10.0	8.84	88	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: HJC      Reviewing Supervisor: MT





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Client: Envirocon, Inc.

Date Sampled: 03-MAY-99 00:00

Date Received: 05-MAY-99

Analysis Date: 14-MAY-1999 14:44

File: /chem/IONTRAP1.i/vb051499524.b/10may14.d

Project Info: PROJ. #140101, LIVINGSTON RAIL YARD

Sample Info: 140101-1655

Lab No.: 004-99-52195

Report Date: 05/17/99 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	0.30J
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	21	D
1,1,1-Trichloroethane	71-55-6	<0.50	0.047J
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	1.1	
Vinyl Chloride	75-01-4	0.98	
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

### ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.71	97	80--120
Toluene d8	10.0	9.28	93	80--120
p-Bromofluorobenzene	10.0	9.09	91	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJC

Reviewing Supervisor: MP



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Client: Envirocon, Inc.  
Date Sampled: 04-MAY-99 00:00  
Date Received: 05-MAY-99  
Analysis Date: 14-MAY-1999 13:15  
File: /chem/IONTRAP1.i/vb051499524.b/08may14.d  
Project Info: PROJ. #140101, LIVINGSTON RAIL YARD  
Sample Info: 140101-1656

Lab No.: 005-99-52195  
Report Date: 05/17/99 15:47  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.2	102	80--120
Toluene d8	10.0	10.3	103	80--120
p-Bromofluorobenzene	10.0	9.30	93	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC      Reviewing Supervisor: ME



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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 05-MAY-99

Analysis Date: 14-MAY-1999 15:25

File: /chem/IONTRAP1.i/vb051499524.b/11may14.d

Project Info: PROJ. #140101, LIVINGSTON RAIL YARD

Sample Info: 140101-1657

Lab No.: 006-99-52195

Report Date: 05/17/99 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	6.9	
trans-1,2-Dichloroethene	156-60-5	<0.50	0.45J
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	46	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	5.3	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.69	97	80--120
Toluene d8	10.0	9.34	93	80--120
p-Bromofluorobenzene	10.0	8.37	84	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HQCReviewing Supervisor: anj



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Client: Envirocon, Inc.  
Date Sampled: 04-MAY-99 00:00  
Date Received: 05-MAY-99  
Analysis Date: 14-MAY-1999 16:06  
File: /chem/IONTRAP1.i/vb051499524.b/12may14.d  
Project Info: PROJ. #140101, LIVINGSTON RAIL YARD  
Sample Info: 140101-1658

Lab No.: 007-99-52195  
Report Date: 05/17/99 15:47  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	21	D
1,2-Dichlorobenzene	95-50-1	1.5	
1,4-Dichlorobenzene	106-46-7	2.9	
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	17	
trans-1,2-Dichloroethene	156-60-5	0.90	
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	6.2	
Vinyl Chloride	75-01-4	11	
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	33	D
1,3-Dichlorobenzene	541-73-1	<0.50	0.43J
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.0	100	80--120
Toluene d8	10.0	8.89	89	80--120
p-Bromofluorobenzene	10.0	8.41	84	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

- U= Indicates compound was analyzed for but not detected.
- D= Value was derived from a 10 times dilution.
- J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MD

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Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 05-MAY-99

Analysis Date: 14-MAY-1999 17:29

File: /chem/IONTRAP1.i/vb051499524.b/14may14.d

Project Info: PROJ. #140101, LIVINGSTON RAIL YARD

Sample Info: 140101-1659

Lab No.: 008-99-52195

Report Date: 05/17/99 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	0.79	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	13	
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	1.9	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.4	104	80--120
Toluene d8	10.0	10.4	104	80--120
p-Bromofluorobenzene	10.0	8.52	85	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJCReviewing Supervisor: MD





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Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 05-MAY-99

Analysis Date: 17-MAY-1999 22:13

File: /chem/IONTRAP2.i/vc051799.b/8b952195.d

Project Info: PROJ. #140101, LIVINGSTON RAIL YARD

Sample Info: 140101-1659

Lab No.: 008-99-52195 Dup

Report Date: 05/21/99 16:12

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	0.68	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	11	
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	2.1	
Vinyl Chloride	75-01-4	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U
Trichlorofluoromethane	75-69-4	<0.50	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.79	88	80--120
Toluene d8	10.0	10.6	106	80--120
p-Bromofluorobenzene	10.0	11.1	111	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MT



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JUN 14 1999

Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 05-MAY-99

Analysis Date: 14-MAY-1999 18:08

File: /chem/IONTRAP1.i/vb051499524.b/15may14.d

Project Info: PROJ. #140101, LIVINGSTON RAIL YARD

Sample Info: 140101-1660

Lab No.: 009-99-52195

Report Date: 05/17/99 15:47

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	1.9	
1,2-Dichlorobenzene	95-50-1	<0.50	0.45J
1,4-Dichlorobenzene	106-46-7	0.88	
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	13	
trans-1,2-Dichloroethene	156-60-5	<0.50	0.31J
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	29	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	8.4	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	0.25J
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

## ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.9	109	80--120
Toluene d8	10.0	8.97	90	80--120
p-Bromofluorobenzene	10.0	9.61	96	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: HJCReviewing Supervisor: nm



Quality Control Sample: Laboratory Reagent Blank 14-MAY-1999 09:11

Report Date: 05/17/99 15:40

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP1.i/vb051499524.b/03may14.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624

VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.4	104	80--120
Toluene d8	10.0	9.25	92	80--120
p-Bromofluorobenzene	10.0	9.65	97	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:   HJC   Reviewing Supervisor:   MP

# EPA METHOD 624 BLANK SPIKE REPORT

=====

Quality Control Sample: Reference Sample Analysis 14-MAY-1999 10:33

Report Date: 05/17/99 15:37

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP1.i/vb051499524.b/04may14.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Carbon Tetrachloride	5.00	5.14	103	70--130
Chlorobenzene	5.00	5.12	102	70--130
1,2-Dichlorobenzene	5.00	5.02	100	70--130
1,4-Dichlorobenzene	5.00	5.19	104	70--130
1,2-Dichloroethane	5.00	4.45	89	70--130
1,1-Dichloroethene	5.00	5.92	118	70--130
cis-1,2-Dichloroethene	5.00	5.65	113	70--130
trans-1,2-Dichloroethene	5.00	6.08	122	70--130
1,2-Dichloropropane	5.00	4.80	96	70--130
Methylene Chloride	5.00	4.50	90	70--130
Tetrachloroethene	5.00	5.09	102	70--130
1,1,1-Trichloroethane	5.00	5.59	112	70--130
1,1,2-Trichloroethane	5.00	5.11	102	70--130
Trichloroethene	5.00	5.16	103	70--130
Bromodichloromethane	5.00	5.22	104	70--130
Bromoform	5.00	5.58	112	70--130
Chlorodibromomethane	5.00	4.65	93	70--130
Chloroform	5.00	5.44	109	70--130
2-Chlorotoluene	5.00	5.28	106	70--130
1,3-Dichlorobenzene	5.00	5.34	107	70--130
1,1-Dichloroethane	5.00	4.96	99	70--130
cis-1,3-Dichloropropene	5.00	5.10	102	70--130
trans-1,3-Dichloropropene	5.00	5.19	104	70--130
1,1,2,2-Tetrachloroethane	5.00	5.00	100	70--130

## ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.47	85	80--120
Toluene d8	10.0	9.50	95	80--120
p-Bromofluorobenzene	10.0	9.40	94	80--120

REPORT COMMENTS: None

Analyst: 74X      Reviewing Supervisor: MD



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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL [eli@energylab.com](mailto:eli@energylab.com)

## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52195-5 mf  
Date : 6/02/99

### GENERAL INFORMATION:

Laboratory No. : 99-52195-5  
Sample Type : WATER  
Sample Point : 140101-1656  
Sample Date : 5/04/99  
Sample Time :  
Sample Received : 5/05/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	43	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	0.46	5/05/99
Ferrous Iron.....(mg/l).....	<0.1	5/05/99
Methane in headspace.....(ppm).....	4 (1)	5/05/99
Methane in water.....(mg/l).....	0.0009 (1.2)	5/05/99

(1) The volume of water in vial 32 mls and the volume of headspace in vial 11 mls.

(2) To convert to ppm(vol/vol) in headspace gas, multiply mg/l in water by 4355.

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52195-6 mf  
Date : 6/02/99

GENERAL INFORMATION:

Laboratory No. : 99-52195-6  
Sample Type : WATER  
Sample Point : 140101-1657  
Sample Date : 5/04/99  
Sample Time :  
Sample Received : 5/05/99

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	117	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	2.30	5/05/99
Ferrous Iron.....(mg/l).....	<0.1	5/05/99
Methane in headspace.....(ppm).....	3 (1)	5/05/99
Methane in water.....(mg/l).....	0.0006 (1,2)	5/05/99

(1) Volume of water in vial 32 mls and volume of headspace in vial is 11 mls.

(2) To convert to ppm (vol/vol) in headspace gas, multiply mg/l in water by 4355.



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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52195-7 mf  
Date : 6/02/99

### GENERAL INFORMATION:

Laboratory No. : 99-52195-7  
Sample Type : WATER  
Sample Point : 140101-1658  
Sample Date : 5/04/99  
Sample Time :  
Sample Received : 5/05/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	23	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	<0.05	5/05/99
Ferrous Iron.....(mg/l).....	1.2	5/05/99
Methane in headspace.....(ppm).....	4300 (1)	5/05/99
Methane in water.....(mg/l).....	0.7603 (1,2)	5/05/99

(1) Volume of water in vial 34 mls and volume of headspace in vial 9 mls.

(2) To convert to ppm (vol/vol) in headspace gas, multiply mg/l in water by 5656.



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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52195-8 mf  
Date : 6/02/99

GENERAL INFORMATION:

Laboratory No. : 99-52195-8  
Sample Type : WATER  
Sample Point : 140101-1659  
Sample Date : 5/04/99  
Sample Time :  
Sample Received : 5/05/99

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	39	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	0.61	5/05/99
Ferrous Iron.....(mg/l).....	<0.1	5/05/99
Methane in headspace.....(ppm).....	7 (1)	5/05/99
Methane in water.....(mg/l).....	0.0009 (1,2)	5/05/99

- (1) Volume of water in vial 36 mls and volume of headspace in vial 7 mls.  
(2) To convert to ppm (vol/vol) in headspace gas, multiply mg/l in water by 7701.



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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52195-9 mf  
Date : 6/02/99

### GENERAL INFORMATION:

Laboratory No. : 99-52195-9  
Sample Type : WATER  
Sample Point : 140101-1660  
Sample Date : 5/04/99  
Sample Time :  
Sample Received : 5/05/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	60	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	0.45	5/05/99
Ferrous Iron.....(mg/l).....	<0.1	5/05/99
Methane in headspace.....(ppm).....	4 (1)	5/05/99
Methane in water.....(mg/l).....	0.0010 (1,2)	5/05/99

- (1) Volume of water in vial 31 mls and volume of headspace in vial 12 mls.  
(2) To convert to ppm (vol/vol) in headspace gas, multiply mg/l in water by 3868.

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 995219510 mf  
Date : 6/02/99

GENERAL INFORMATION:

Laboratory No. : 995219510  
Sample Type : WATER  
Sample Point : 140101-1661  
Sample Date : 5/04/99  
Sample Time :  
Sample Received : 5/05/99

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	33	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	0.56	5/05/99
Ferrous Iron.....(mg/l).....	<0.1	5/05/99
Methane in headspace.....(ppm).....	3 (1)	5/05/99
Methane in water.....(mg/l).....	0.0006 (1,2)	5/05/99

- (1) Volume of water in vial 33 mls and volume of headspace in vial 10 mls.  
(2) To convert to ppm (vol/vol) in headspace gas, multiply mg/l in water by 4941.

Lab Nos. 99-52195-5-10

QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

<u>Constituents</u>	Duplicate Analysis		Spiked	Blank Analysis, mg/l (ppm)	-----Calibration Verification-----		<u>Date Analyzed</u>
	-----mg/l (ppm)-----		Analysis, %		Sample	Acceptance	
	<u>Original</u>	<u>Duplicate</u>	<u>Recovery</u>		<u>Analysis, mg/l (ppm)</u>	<u>Range, mg/l (ppm)</u>	
Sulfate	23	24	93	< 1	50	45-55	05/07/99
Nitrate plus Nitrite as N	0.46	0.47	92	< 0.05	2.36	2.04-2.56	05/05/99
Ferrous Iron	< 0.1	< 0.1	96	< 0.1	2.0	1.8-2.2	05/05/99

Date: 05-MAY-99

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

## SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form

Completed &amp; Signed

Yes Comments: \_\_\_\_\_

Chain of Custody Seal

Yes Comments: \_\_\_\_\_

Intact

Yes Comments: \_\_\_\_\_

Signature Match Chain of Custody vs. Seal

Yes Comments: \_\_\_\_\_

Samples Received Cold

Yes Comments: \_\_\_\_\_

Samples Received Within Holding Time

Yes Comments: \_\_\_\_\_

Samples Received in Proper Containers

Yes Comments: \_\_\_\_\_

Samples Received Properly Preserved

N/A Comments: \_\_\_\_\_

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 664 1

Additional comments: \_\_\_\_\_







**ENERGY LABORATORIES, INC.**

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June 2, 1999

Michael McKinsey  
Envirocon, Inc.  
P.O. Box 16655  
Missoula, MT 59808

Dear Michael:

On May 05, 1999, these samples, represented by our laboratory numbers 001-99-52195 through 010-99-52195, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by: \_\_\_\_\_

A handwritten signature in black ink, appearing to be "W. J. ...", written over a horizontal line.



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Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 12-MAY-1999 23:12

File: /IONTRAP1.i/vb051299524.b/10may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1662

Lab No.: 001-99-52245

Report Date: 05/17/99 15:54

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.2	102	80--120
Toluene d8	10.0	8.96	90	80--120
p-Bromofluorobenzene	10.0	9.31	93	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:

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Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 12-MAY-1999 23:50

File: /IONTRAP1.i/vb051299524.b/11may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1663

Lab No.: 002-99-52245

Report Date: 05/17/99 15:54

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.91	99	80--120
Toluene d8	10.0	8.68	87	80--120
p-Bromofluorobenzene	10.0	9.06	91	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                     Reviewing Supervisor:



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Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 14-MAY-1999 23:57

File: /IONTRAP1.i/vb051499524.b/24may14.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1663

Lab No.: 002-99-52245DUP

Report Date: 05/17/99 16:05

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.5	105	80--120
Toluene d8	10.0	10.1	101	80--120
p-Bromofluorobenzene	10.0	8.84	88	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: MP Reviewing Supervisor: mg



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Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 13-MAY-1999 00:29

File: /IONTRAP1.i/vb051299524.b/12may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1664

Lab No.: 003-99-52245

Report Date: 05/17/99 15:54

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	0.21J
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.68	97	80--120
Toluene d8	10.0	9.73	97	80--120
p-Bromofluorobenzene	10.0	8.75	88	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst:                     Reviewing Supervisor:



# ENERGY LABORATORIES, INC.

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.

Date Sampled: 04-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 13-MAY-1999 01:08

File: /IONTRAP1.i/vb051299524.b/13may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1665

Lab No.: 004-99-52245

Report Date: 05/17/99 15:55

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	0.28J
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

## ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.26	93	80--120
Toluene d8	10.0	8.82	88	80--120
p-Bromofluorobenzene	10.0	8.86	89	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: [Signature] Reviewing Supervisor: [Signature]

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.

Date Sampled: 05-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 19-MAY-1999 14:56

File: /chem/IONTRAP2.i/vc051999.b/6b952245.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1666

Lab No.: 006-99-52245

Report Date: 05/19/99 16:12

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	1.6	
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
Methylene Chloride	75-09-2	<1.0	U
Tetrachloroethene	127-18-4	1.7	
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	6.1	
Vinyl Chloride	75-01-4	<1.0	U
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
Chloroform	67-66-3	<1.0	U
Bromomethane	74-83-9	<1.0	U
Chloromethane	74-87-3	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<2.0	U
2-Chlorotoluene	95-49-8	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	20.0	16.1	80	80--120
Toluene d8	20.0	22.2	111	80--120
p-Bromofluorobenzene	20.0	19.9	99	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: Practical quantitation limit reflects a 2 times dilution.  
The sample was diluted due to non-target compound sample matrix interference.Analyst: HJC      Reviewing Supervisor: MJ





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Client: Envirocon, Inc.

Date Sampled: 05-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 14-MAY-1999 14:02

File: /IONTRAP1.i/vb051499524.b/09may14.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1667

Lab No.: 007-99-52245

Report Date: 05/17/99 15:58

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.86	99	80--120
Toluene d8	10.0	9.05	90	80--120
p-Bromofluorobenzene	10.0	9.43	94	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.

Date Sampled: 05-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 13-MAY-1999 01:46

File: /IONTRAP1.i/vb051299524.b/14may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1668

Lab No.: 005-99-52245

Report Date: 05/17/99 15:55

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	0.96	
Bromoform	75-25-2	0.92	
Chlorodibromomethane	124-48-1	1.4	
Chloroform	67-66-3	0.94	
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

## ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.5	105	80--120
Toluene d8	10.0	9.89	99	80--120
p-Bromofluorobenzene	10.0	9.23	92	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:



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Client: Envirocon, Inc.

Date Sampled: 05-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 13-MAY-1999 02:25

File: /IONTRAP1.i/vb051299524.b/15may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1669

Lab No.: 008-99-52245

Report Date: 05/17/99 15:54

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	0.25J
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	0.60	
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.74	97	80--120
Toluene d8	10.0	8.56	86	80--120
p-Bromofluorobenzene	10.0	9.42	94	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:



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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.

Date Sampled: 05-MAY-99 00:00

Date Received: 06-MAY-99

Analysis Date: 13-MAY-1999 03:04

File: /IONTRAP1.i/vb051299524.b/16may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1670

Lab No.: 009-99-52245

Report Date: 05/17/99 15:54

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	0.20J
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.91	99	80--120
Toluene d8	10.0	8.91	89	80--120
p-Bromofluorobenzene	10.0	8.80	88	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: 

Reviewing Supervisor: 

Quality Control Sample: Laboratory Reagent Blank 12-MAY-1999 22:34

Report Date: 05/17/99 15:49

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb051299524.b/09may12.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624

VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.8	108	80--120
Toluene d8	10.0	10.1	101	80--120
p-Bromofluorobenzene	10.0	9.34	93	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: RAE

Reviewing Supervisor: mm

# EPA METHOD 624 BLANK SPIKE REPORT

=====

Quality Control Sample: Reference Sample Analysis 10-MAY-99 22:29

Report Date: 05/17/99 16:17

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb051299524.b/13may10.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

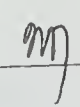
Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Carbon Tetrachloride	5.00	5.33	107	60--140
Chlorobenzene	5.00	5.17	103	60--140
1,2-Dichlorobenzene	5.00	5.49	110	60--140
1,4-Dichlorobenzene	5.00	5.62	112	60--140
1,2-Dichloroethane	5.00	5.11	102	60--140
1,1-Dichloroethene	5.00	6.17	123	60--140
cis-1,2-Dichloroethene	5.00	5.26	105	60--140
trans-1,2-Dichloroethene	5.00	6.00	120	60--140
1,2-Dichloropropane	5.00	5.18	104	60--140
Methylene Chloride	5.00	4.69	94	60--140
Tetrachloroethene	5.00	5.54	111	60--140
1,1,1-Trichloroethane	5.00	5.60	112	60--140
1,1,2-Trichloroethane	5.00	5.31	106	60--140
Trichloroethene	5.00	5.49	110	60--140
Vinyl Chloride	5.00	5.14	103	60--140
2-Chloroethylvinyl ether	5.00	4.44	89	60--140
Bromodichloromethane	5.00	5.47	109	60--140
Bromoform	5.00	5.81	116	60--140
Chlorodibromomethane	5.00	4.99	100	60--140
Chloroform	5.00	5.51	110	60--140
Bromomethane	5.00	4.46	89	60--140
Chloroethane	5.00	4.83	97	60--140
Chloromethane	5.00	5.30	106	60--140
2-Chlorotoluene	5.00	5.40	108	60--140
1,3-Dichlorobenzene	5.00	5.69	114	60--140
Dichlorodifluoromethane	5.00	6.06	121	60--140
1,1-Dichloroethane	5.00	4.99	100	60--140
cis-1,3-Dichloropropene	5.00	5.58	112	60--140
trans-1,3-Dichloropropene	5.00	5.58	112	60--140
Fluorotrichloromethane	5.00	4.72	94	60--140
1,1,2,2-Tetrachloroethane	5.00	5.45	109	60--140

## ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.82	98	80--120
Toluene d8	10.0	9.64	96	80--120
p-Bromofluorobenzene	10.0	9.58	96	80--120

REPORT COMMENTS: None

Analyst: 

Reviewing Supervisor: 



# EPA METHOD 624 MATRIX SPIKE REPORT

=====

Quality Control Sample: Matrix Spike Analysis 15-MAY-1999 00:36

Lab No.: 001-99-52245

Report Date: 05/17/99 16:04

Extraction Method: EPA 5030

Sample Matrix: WATER



File: /IONTRAP1.i/vb051499524.b/25may14.d

Remarks: These compounds were spiked into the sample matrix to determine if the sample matrix contributes bias to the analytical results and to monitor the accuracy of the methodology.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Spike Added	Sample Concentration	Matrix Spike Concentration	MS %Rec	QC Limits
Chlorobenzene	5.00	<0.500	5.32	106	60--140
1,1-Dichloroethene	5.00	<0.500	5.70	114	60--140
Trichloroethene	5.00	<0.500	5.33	107	60--140

REPORT COMMENTS: None

Analyst:  Reviewing Supervisor: 





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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 9952245-6 mf  
Date : 5/28/99

### GENERAL INFORMATION:

Laboratory No. : 9952245-6  
Sample Type : WATER  
Sample Point : 140101-1666  
Sample Date : 5/05/99  
Sample Time :  
Sample Received : 5/06/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	31	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	0.13	5/10/99
Ferrous Iron.....(mg/l).....	8.5	5/06/99
Methane in headspace.....(ppm).....	790 (1)	5/06/99

(1) Volume of water in vial 33 mls and headspace in vial 10 mls.



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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 9952245-7 mf  
Date : 5/28/99

### GENERAL INFORMATION:

Laboratory No. : 9952245-7  
Sample Type : WATER  
Sample Point : 140101-1667  
Sample Date : 5/05/99  
Sample Time :  
Sample Received : 5/06/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	19	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	<0.05	5/10/99
Ferrous Iron.....(mg/l).....	0.1	5/06/99
Methane in headspace.....(ppm).....	2024 (1)	5/06/99

(1) Volume of water in vial 33 mls and headspace in vial 10 mls.

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 9952245-8 mf  
Date : 5/28/99

GENERAL INFORMATION:

Laboratory No. : 9952245-8  
Sample Type : WATER  
Sample Point : 140101-1669  
Sample Date : 5/05/99  
Sample Time :  
Sample Received : 5/06/99

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	45	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	1.12	5/10/99
Ferrous Iron.....(mg/l).....	<0.1	5/06/99
Methane in headspace.....(ppm).....	5 (1)	5/06/99

(1) Volume of water in vial is 33 mls and headspace in vial is 10 mls.



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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 9952245-9 mf  
Date : 5/28/99

### GENERAL INFORMATION:

Laboratory No. : 9952245-9  
Sample Type : WATER  
Sample Point : 140101-1670  
Sample Date : 5/05/99  
Sample Time :  
Sample Received : 5/06/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	45	5/07/99
Nitrate plus Nitrite as N.....(mg/l).....	3.27	5/10/99
Ferrous Iron.....(mg/l).....	<0.1	5/06/99
Methane in headspace.....(ppm).....	4 (1)	5/06/99

(1) Volume of water in vial 33 mls and headspace in vial 10 mls.

Lab Nos. 99-52245-6-9

QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

<u>Constituents</u>	<u>Duplicate Analysis</u>		<u>Spiked Analysis,</u>	<u>Blank Analysis,</u>	<u>Sample Analysis,</u>	<u>-----Calibration Verification-----</u>	<u>Date Analyzed</u>
	<u>Original</u>	<u>Duplicate</u>	<u>Recovery</u>			<u>Acceptance Range,</u>	
	<u>-----mg/l (ppm)-----</u>		<u>%</u>	<u>mg/l (ppm)</u>	<u>mg/l (ppm)</u>	<u>mg/l (ppm)</u>	
Sulfate	364	361	116	< 1	50	45-55	05/07/99
Nitrate plus Nitrite as N	<0.05	<0.05	100	<0.05	2.35	2.04-2.56	05/10/99
Ferrous Iron	8.5	8.5	92	<0.1	2.1	1.8-2.2	05/06/99



Lab Nos.: 001-99-52245 009-99-52245

Date: 06-MAY-99

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form	
Completed & Signed	<u>Yes</u> Comments: _____
Chain of Custody Seal	<u>Yes</u> Comments: _____
Intact	<u>Yes</u> Comments: _____
Signature Match Chain of Custody vs. Seal	<u>Yes</u> Comments: _____
Samples Received Cold	<u>Yes</u> Comments: _____
Samples Received Within Holding Time	<u>Yes</u> Comments: _____
Samples Received in Proper Containers	<u>Yes</u> Comments: _____
Samples Received Properly Preserved	<u>Yes</u> Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 736 7

Additional comments: \_\_\_\_\_

# CHAIN OF CUSTODY RECORD

PLEASE PRINT OR TYPE ALL  
INFORMATION EXCEPT SIGNATURES

Received Date: 05/06/99 Cust. No.: 51023M  
 Login Date: 5 Login No.: 5  
 Shipped by: Handlound Custody Seal: Yes / No  
 Shipping Bill #: 1507367367 Intact: Yes / No  
 Signature Match?: Yes / No  
 If no - Reason: \_\_\_\_\_

For Lab Use Only

ENERGY LABORATORIES, INC. P.O. Box 30916 1120 South 27th Street Billings, Montana 59107	800-735-4489 voice 406-252-6325 voice 406-252-6069 Fax	ENERGY LABORATORIES, INC. 1105 West First Street Gillette, Wyoming 82716	307-686-7175 voice 307-682-4625 Fax	ENERGY LABORATORIES, INC. P.O. Box 2470 610 Farmwood Rapid City, South Dakota 57709	888-672-1225 voice 605-342-1225 voice 605-342-1397 Fax
--	---	--	--	--	---

P.O. #	Project Name / Address	Contact Name & Phone	Sampler's Signature	DATE	TIME	Invoice to:	Report to:	Sample Type: A W S V U O	number of containers	Analysis Requested				Comments, Special Instructions, etc.
										Nitrate + NO <sub>3</sub>	Methane	Ferrus Iron		
140101	Livingston Rail Yard	Mike McKinsey (406) 523-1167	<i>Mike McKinsey</i>	5/4/99		Environ	Environ 500 Taylor Missoula, MT 59802 SAMPLE I.D.	2W	X	X	X	X		
002							140101- 1662		X					
003							- 1663		X					
004							- 1664		X					
005							- 1665		X					
006				5/5/99			140101- 1666	6W	X	X	X	X		From sample has not been Filtered
007							- 1667	6W	X	X	X	X		
008							- 1668	2W	X					
009							- 1669	6W	X	X	X	X		
010							- 1670	6W	X	X	X	X		

1. Relinquished (signature) <i>Mike McKinsey</i>	Date 5/5/99	Time 1515	Received by: (signature) <i>Mike McKinsey</i>	2. Relinquished (signature)	Date 25/06/99	Time 0740	Received for Laboratory by: (signature) <i>Mike McKinsey</i>
---	----------------	--------------	--	-----------------------------	------------------	--------------	---



**ENERGY LABORATORIES, INC.**

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June 1, 1999

Michael McKinsey  
Envirocon, Inc.  
P.O. Box 16655  
Missoula, MT 59808

Dear Michael:

On May 06, 1999, these samples, represented by our laboratory numbers 001-99-52245 through 009-99-52245, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by:

A handwritten signature in dark ink, appearing to read "W. J. Rippin", written over a horizontal line.





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Client: Envirocon, Inc.

Date Sampled: 06-MAY-99 00:00

Date Received: 08-MAY-99

Analysis Date: 13-MAY-1999 08:16

File: /IONTRAP1.i/vb051299524.b/24may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1671

Lab No.: 001-99-52345

Report Date: 05/14/99 07:54

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	1.5	
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	2.9	
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	7.6	
trans-1,2-Dichloroethene	156-60-5	<0.50	0.24J
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	17	
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	7.2	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	0.31J
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.58	96	80--120
Toluene d8	10.0	10.0	100	80--120
p-Bromofluorobenzene	10.0	9.73	97	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:



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Client: Envirocon, Inc.

Date Sampled: 06-MAY-99 00:00

Date Received: 08-MAY-99

Analysis Date: 13-MAY-99 08:54

File: /IONTRAP1.i/vb051299524.b/25may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1672

Lab No.: 002-99-52345

Report Date: 05/14/99 07:54

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.35	94	80--120
Toluene d8	10.0	8.75	88	80--120
p-Bromofluorobenzene	10.0	9.87	99	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                     Reviewing Supervisor:

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Client: Envirocon, Inc.

Date Sampled: 06-MAY-99 00:00

Date Received: 08-MAY-99

Analysis Date: 13-MAY-99 09:34

File: /IONTRAP1.i/vb051299524.b/26may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1673

Lab No.: 003-99-52345

Report Date: 05/14/99 07:55

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	0.53	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	17	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	1.5	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.92	99	80--120
Toluene d8	10.0	9.28	93	80--120
p-Bromofluorobenzene	10.0	9.73	97	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: RAK Reviewing Supervisor: nm

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.

Date Sampled: 06-MAY-99 00:00

Date Received: 08-MAY-99

Analysis Date: 13-MAY-99 10:13

File: /IONTRAP1.i/vb051299524.b/27may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1674

Lab No.: 004-99-52345

Report Date: 05/14/99 07:56

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.83	98	80--120
Toluene d8	10.0	10.3	103	80--120
p-Bromofluorobenzene	10.0	9.14	91	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:



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Client: Envirocon, Inc.

Date Sampled: 06-MAY-99 00:00

Date Received: 08-MAY-99

Analysis Date: 13-MAY-99 10:52

File: /IONTRAP1.i/vb051299524.b/28may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1675

Lab No.: 005-99-52345

Report Date: 05/14/99 07:57

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
=====	=====		=====	=====
Carbon Tetrachloride	56-23-5		<0.50	U
Chlorobenzene	108-90-7		<0.50	U
1,2-Dichlorobenzene	95-50-1		<0.50	U
1,4-Dichlorobenzene	106-46-7		<0.50	U
1,2-Dichloroethane	107-06-2		<0.50	U
1,1-Dichloroethene	75-35-4		<0.50	U
cis-1,2-Dichloroethene	156-59-2		<0.50	0.31J
trans-1,2-Dichloroethene	156-60-5		<0.50	U
1,2-Dichloropropane	78-87-5		<0.50	U
Methylene Chloride	75-09-2		<0.50	U
Tetrachloroethene	127-18-4		6.6	
1,1,1-Trichloroethane	71-55-6		<0.50	U
1,1,2-Trichloroethane	79-00-5		<0.50	U
Trichloroethene	79-01-6		<0.50	0.46J
Vinyl Chloride	75-01-4		<0.50	U
2-Chloroethylvinyl ether	110-75-8		<0.50	U
Bromodichloromethane	75-27-4		<0.50	U
Bromoform	75-25-2		<0.50	U
Chlorodibromomethane	124-48-1		<0.50	U
Chloroform	67-66-3		<0.50	U
Bromomethane	74-83-9		<0.50	U
Chloroethane	75-00-3		<0.50	U
Chloromethane	74-87-3		<0.50	U
2-Chlorotoluene	95-49-8		<0.50	U
1,3-Dichlorobenzene	541-73-1		<0.50	U
Dichlorodifluoromethane	75-71-8		<0.50	U
1,1-Dichloroethane	75-34-3		<0.50	U
cis-1,3-Dichloropropene	10061-01-5		<0.50	U
trans-1,3-Dichloropropene	10061-02-6		<0.50	U
Fluorotrichloromethane	75-69-4		<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5		<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.63	96	80--120
Toluene d8	10.0	8.71	87	80--120
p-Bromofluorobenzene	10.0	9.48	95	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

REPORT COMMENTS: None

Analyst: [Signature] Reviewing Supervisor: [Signature]

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Client: Envirocon, Inc.

Date Sampled: 06-MAY-99 00:00

Date Received: 08-MAY-99

Analysis Date: 13-MAY-99 11:31

File: /IONTRAP1.i/vb051299524.b/29may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1676

Lab No.: 006-99-52345

Report Date: 05/14/99 07:57

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	1.6	
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.7	107	80--120
Toluene d8	10.0	9.78	98	80--120
p-Bromofluorobenzene	10.0	9.04	90	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:   *REP*  Reviewing Supervisor:   *nm*





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Client: Envirocon, Inc.

Date Sampled: 07-MAY-99 00:00

Date Received: 08-MAY-99

Analysis Date: 18-MAY-1999 15:49

File: /chem/IONTRAP2.i/vc051899.b/09952345.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1677

Lab No.: 009-99-52345

Report Date: 05/20/99 16:47

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= < 2

## EPA METHOD 524.2 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====

### -----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----

Benzene	71-43-2	5	<0.50	U
Carbon tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

### -----REGULATED VOC'S: TRIHALOMETHANES-----

Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	0.78	
Chlorodibromomethane	124-48-1	four	<0.50	0.31J
Chloroform	67-66-3	100	<0.50	U

### -----OTHER EPA LISTED VOC'S-----

Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Methyl-t-butyl ether	1634-04-4	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
Trichlorofluoromethane	75-69-4	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	7.26	73*	80--120
Toluene d8	10.0	12.0	120	80--120
p-Bromofluorobenzene	10.0	10.1	101	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

\*= Surrogate recovery outside QC advisory limits.

REPORT COMMENTS: None

Analyst: JA      Reviewing Supervisor: WJ

Quality Control Sample: Laboratory Reagent Blank 18-MAY-1999 14:59

Report Date: 05/20/99 16:57

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc051899.b/blk0518a.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 524.2

VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Methyl-t-butyl ether	1634-04-4	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
Trichlorofluoromethane	75-69-4	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.37	94	80--120
Toluene d8	10.0	9.98	100	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: HJC Reviewing Supervisor: MJ



# EPA METHOD 524.2 BLANK SPIKE REPORT

=====

Quality Control Sample: Reference Sample Analysis 17-MAY-1999 14:50

Report Date: 05/20/99 17:07

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc051799.b/qcs0517a.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Benzene	5.00	4.98	100	60--140
Carbon tetrachloride	5.00	5.50	110	60--140
Chlorobenzene	5.00	5.18	104	60--140
1,2-Dichlorobenzene	5.00	4.64	93	60--140
1,4-Dichlorobenzene	5.00	5.22	104	60--140
1,2-Dichloroethane	5.00	5.12	102	60--140
1,1-Dichloroethene	5.00	4.88	98	60--140
cis-1,2-Dichloroethene	5.00	5.31	106	60--140
trans-1,2-Dichloroethene	5.00	5.01	100	60--140
1,2-Dichloropropane	5.00	5.34	107	60--140
Ethylbenzene	5.00	5.34	107	60--140
Methylene Chloride	5.00	5.22	104	60--140
Styrene	5.00	5.08	102	60--140
Tetrachloroethene	5.00	5.40	108	60--140
Toluene	5.00	5.26	105	60--140
1,2,4-Trichlorobenzene	5.00	5.27	105	60--140
1,1,1-Trichloroethane	5.00	5.25	105	60--140
1,1,2-Trichloroethane	5.00	4.92	98	60--140
Trichloroethene	5.00	5.28	106	60--140
Vinyl Chloride	5.00	4.84	97	60--140
m+p-Xylenes	10.0	11.7	117	60--140
o-Xylene	5.00	5.15	103	60--140
Bromodichloromethane	5.00	5.12	102	60--140
Bromoform	5.00	4.33	87	60--140
Chlorodibromomethane	5.00	5.09	102	60--140
Chloroform	5.00	5.05	101	60--140
Bromobenzene	5.00	5.58	112	60--140
Bromochloromethane	5.00	3.04	61	60--140
Bromomethane	5.00	6.87	137	60--140
n-Butylbenzene	5.00	6.00	120	60--140
sec-Butylbenzene	5.00	5.92	118	60--140
tert-Butylbenzene	5.00	5.51	110	60--140
Chloroethane	5.00	5.21	104	60--140
Chloromethane	5.00	6.63	133	60--140
2-Chlorotoluene	5.00	6.06	121	60--140
4-Chlorotoluene	5.00	5.64	113	60--140
1,2-Dibromo-3-chloropropane	5.00	4.40	88	60--140
1,2-Dibromoethane	5.00	4.36	87	60--140
Dibromomethane	5.00	4.84	97	60--140
1,3-Dichlorobenzene	5.00	5.18	104	60--140
Dichlorodifluoromethane	5.00	5.27	105	60--140

(report continued on page 2)



EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

Spike Compound	CONCENTRATION UNITS = ug/L (ppb)			
	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
1,1-Dichloroethane	5.00	5.23	105	60--140
1,1-Dichloropropene	5.00	5.26	105	60--140
1,3-Dichloropropane	5.00	4.57	91	60--140
cis-1,3-Dichloropropene	5.00	5.17	103	60--140
trans-1,3-Dichloropropene	5.00	4.93	99	60--140
2,2-Dichloropropane	5.00	5.31	106	60--140
Hexachlorobutadiene	5.00	5.71	114	60--140
Isopropylbenzene	5.00	5.89	118	60--140
p-Isopropyltoluene	5.00	5.54	111	60--140
Methyl-t-butyl ether	5.00	4.34	87	60--140
Naphthalene	5.00	5.11	102	60--140
n-Propylbenzene	5.00	6.02	120	60--140
1,1,1,2-Tetrachloroethane	5.00	4.58	92	60--140
1,1,2,2-Tetrachloroethane	5.00	4.63	93	60--140
Trichlorofluoromethane	5.00	4.79	96	60--140
1,2,3-Trichlorobenzene	5.00	4.92	98	60--140
1,2,3-Trichloropropane	5.00	4.60	92	60--140
1,2,4-Trimethylbenzene	5.00	5.62	112	60--140
1,3,5-Trimethylbenzene	5.00	5.94	119	60--140

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.13	91	80--120
Toluene d8	10.0	10.9	109	80--120
p-Bromofluorobenzene	10.0	10.5	105	80--120

REPORT COMMENTS: None

Analyst: HF      Reviewing Supervisor: MY



# ENERGY LABORATORIES, INC.

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Client: Envirocon, Inc.  
Date Sampled: 07-MAY-99 00:00  
Date Received: 08-MAY-99  
Analysis Date: 13-MAY-99 12:10  
File: /IONTRAP1.i/vb051299524.b/30may12.d  
Project Info: LIVINGSTON RAIL YARD, PROJ. #140101  
Sample Info: 140101-1678

Lab No.: 007-99-52345  
Report Date: 05/14/99 07:58  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	1.2	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	41	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	2.2	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.92	99	80--120
Toluene d8	10.0	9.20	92	80--120
p-Bromofluorobenzene	10.0	9.44	94	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst: [Signature] Reviewing Supervisor: [Signature]

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Client: Envirocon, Inc.

Date Sampled: 07-MAY-99 00:00

Date Received: 08-MAY-99

Analysis Date: 13-MAY-99 12:49

File: /IONTRAP1.i/vb051299524.b/31may12.d

Project Info: LIVINGSTON RAIL YARD, PROJ. #140101

Sample Info: 140101-1679

Lab No.: 008-99-52345

Report Date: 05/14/99 07:59

Extraction Method: EPA 5030

Sample Matrix: WATER; pH= &lt; 2

**EPA METHOD 624  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	1.2	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	65	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	2.2	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.50	95	80--120
Toluene d8	10.0	9.69	97	80--120
p-Bromofluorobenzene	10.0	9.45	94	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

D= Value was derived from a 10 times dilution.

REPORT COMMENTS: None

Analyst:   *AP*  Reviewing Supervisor:   *MM*

Quality Control Sample: Laboratory Reagent Blank 13-MAY-99 06:57

Report Date: 05/14/99 07:52

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb051299524.b/22may12.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624

VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.4	104	80--120
Toluene d8	10.0	9.92	99	80--120
p-Bromofluorobenzene	10.0	9.07	91	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:



# EPA METHOD 624 BLANK SPIKE REPORT

=====

Quality Control Sample: Reference Sample Analysis 10-MAY-99 22:29

Report Date: 05/17/99 16:17

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb051299524.b/13may10.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Carbon Tetrachloride	5.00	5.33	107	60--140
Chlorobenzene	5.00	5.17	103	60--140
1,2-Dichlorobenzene	5.00	5.49	110	60--140
1,4-Dichlorobenzene	5.00	5.62	112	60--140
1,2-Dichloroethane	5.00	5.11	102	60--140
1,1-Dichloroethene	5.00	6.17	123	60--140
cis-1,2-Dichloroethene	5.00	5.26	105	60--140
trans-1,2-Dichloroethene	5.00	6.00	120	60--140
1,2-Dichloropropane	5.00	5.18	104	60--140
Methylene Chloride	5.00	4.69	94	60--140
Tetrachloroethene	5.00	5.54	111	60--140
1,1,1-Trichloroethane	5.00	5.60	112	60--140
1,1,2-Trichloroethane	5.00	5.31	106	60--140
Trichloroethene	5.00	5.49	110	60--140
Vinyl Chloride	5.00	5.14	103	60--140
2-Chloroethylvinyl ether	5.00	4.44	89	60--140
Bromodichloromethane	5.00	5.47	109	60--140
Bromoform	5.00	5.81	116	60--140
Chlorodibromomethane	5.00	4.99	100	60--140
Chloroform	5.00	5.51	110	60--140
Bromomethane	5.00	4.46	89	60--140
Chloroethane	5.00	4.83	97	60--140
Chloromethane	5.00	5.30	106	60--140
2-Chlorotoluene	5.00	5.40	108	60--140
1,3-Dichlorobenzene	5.00	5.69	114	60--140
Dichlorodifluoromethane	5.00	6.06	121	60--140
1,1-Dichloroethane	5.00	4.99	100	60--140
cis-1,3-Dichloropropene	5.00	5.58	112	60--140
trans-1,3-Dichloropropene	5.00	5.58	112	60--140
Fluorotrichloromethane	5.00	4.72	94	60--140
1,1,2,2-Tetrachloroethane	5.00	5.45	109	60--140

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.82	98	80--120
Toluene d8	10.0	9.64	96	80--120
p-Bromofluorobenzene	10.0	9.58	96	80--120

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:



Lab Nos.: 001-99-52345 - 009-99-52345

Date: 08-MAY-99

Received by: Bob Reid 05/08/99

Login Date: 10-MAY-99

Logged In by: Pam Harder 05/10/99

## SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal	<u>Yes</u>	Comments: _____
Intact	<u>Yes</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>Yes</u>	Comments: _____
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>Yes</u>	Comments: _____
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>N/A</u>	Comments: _____

**Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.**

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 737 8

Additional comments: \_\_\_\_\_

[illegible]



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May 25, 1999

Michael McKinsey  
Envirocon, Inc.  
P.O. Box 16655  
Missoula, MT 59808

Dear Michael:

On May 10, 1999, these samples, represented by our laboratory numbers 001-99-52345 through 009-99-52345, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by:

W. J. Rippert





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Client: Envirocon, Inc.  
Date Sampled: 10-MAY-99 00:00  
Date Received: 11-MAY-99  
Analysis Date: 13-MAY-99 14:07  
File: /IONTRAP1.i/vb051299524.b/33may12.d  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: 140101-1680

Lab No.: 001-99-52436  
Report Date: 05/14/99 08:03  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 624 VOLATILE ORGANICS ANALYSIS REPORT

=====

### CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	0.62	
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	130	D
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	1.5	
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.64	96	80--120
Toluene d8	10.0	8.94	89	80--120
p-Bromofluorobenzene	10.0	9.44	94	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.  
D= Value was derived from a 20 times dilution.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:



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Client: Envirocon, Inc.  
Date Sampled: 11-MAY-99 00:00  
Date Received: 11-MAY-99  
Analysis Date: 13-MAY-99 14:47  
File: /IONTRAP1.i/vb051299524.b/34may12.d  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: 140101-1682

Lab No.: 005-99-52436  
Report Date: 05/14/99 08:03  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 624**  
**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.6	106	80--120
Toluene d8	10.0	10.2	102	80--120
p-Bromofluorobenzene	10.0	9.36	94	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                      Reviewing Supervisor:

Quality Control Sample: Laboratory Reagent Blank 13-MAY-99 06:57

Report Date: 05/14/99 07:52

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb051299524.b/22may12.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 624

VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	RESULT	QUALIFIER
=====	=====	=====	=====
Carbon Tetrachloride	56-23-5	<0.50	U
Chlorobenzene	108-90-7	<0.50	U
1,2-Dichlorobenzene	95-50-1	<0.50	U
1,4-Dichlorobenzene	106-46-7	<0.50	U
1,2-Dichloroethane	107-06-2	<0.50	U
1,1-Dichloroethene	75-35-4	<0.50	U
cis-1,2-Dichloroethene	156-59-2	<0.50	U
trans-1,2-Dichloroethene	156-60-5	<0.50	U
1,2-Dichloropropane	78-87-5	<0.50	U
Methylene Chloride	75-09-2	<0.50	U
Tetrachloroethene	127-18-4	<0.50	U
1,1,1-Trichloroethane	71-55-6	<0.50	U
1,1,2-Trichloroethane	79-00-5	<0.50	U
Trichloroethene	79-01-6	<0.50	U
Vinyl Chloride	75-01-4	<0.50	U
2-Chloroethylvinyl ether	110-75-8	<0.50	U
Bromodichloromethane	75-27-4	<0.50	U
Bromoform	75-25-2	<0.50	U
Chlorodibromomethane	124-48-1	<0.50	U
Chloroform	67-66-3	<0.50	U
Bromomethane	74-83-9	<0.50	U
Chloroethane	75-00-3	<0.50	U
Chloromethane	74-87-3	<0.50	U
2-Chlorotoluene	95-49-8	<0.50	U
1,3-Dichlorobenzene	541-73-1	<0.50	U
Dichlorodifluoromethane	75-71-8	<0.50	U
1,1-Dichloroethane	75-34-3	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	<0.50	U
Fluorotrichloromethane	75-69-4	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	<0.50	U

----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	10.4	104	80--120
Toluene d8	10.0	9.92	99	80--120
p-Bromofluorobenzene	10.0	9.07	91	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst:                     

Reviewing Supervisor:

# EPA METHOD 624 BLANK SPIKE REPORT

=====

Quality Control Sample: Reference Sample Analysis 10-MAY-99 22:29

Report Date: 05/17/99 16:17

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb051299524.b/13may10.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)

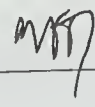
Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Carbon Tetrachloride	5.00	5.33	107	60--140
Chlorobenzene	5.00	5.17	103	60--140
1,2-Dichlorobenzene	5.00	5.49	110	60--140
1,4-Dichlorobenzene	5.00	5.62	112	60--140
1,2-Dichloroethane	5.00	5.11	102	60--140
1,1-Dichloroethene	5.00	6.17	123	60--140
cis-1,2-Dichloroethene	5.00	5.26	105	60--140
trans-1,2-Dichloroethene	5.00	6.00	120	60--140
1,2-Dichloropropane	5.00	5.18	104	60--140
Methylene Chloride	5.00	4.69	94	60--140
Tetrachloroethene	5.00	5.54	111	60--140
1,1,1-Trichloroethane	5.00	5.60	112	60--140
1,1,2-Trichloroethane	5.00	5.31	106	60--140
Trichloroethene	5.00	5.49	110	60--140
Vinyl Chloride	5.00	5.14	103	60--140
2-Chloroethylvinyl ether	5.00	4.44	89	60--140
Bromodichloromethane	5.00	5.47	109	60--140
Bromoform	5.00	5.81	116	60--140
Chlorodibromomethane	5.00	4.99	100	60--140
Chloroform	5.00	5.51	110	60--140
Bromomethane	5.00	4.46	89	60--140
Chloroethane	5.00	4.83	97	60--140
Chloromethane	5.00	5.30	106	60--140
2-Chlorotoluene	5.00	5.40	108	60--140
1,3-Dichlorobenzene	5.00	5.69	114	60--140
Dichlorodifluoromethane	5.00	6.06	121	60--140
1,1-Dichloroethane	5.00	4.99	100	60--140
cis-1,3-Dichloropropene	5.00	5.58	112	60--140
trans-1,3-Dichloropropene	5.00	5.58	112	60--140
Fluorotrichloromethane	5.00	4.72	94	60--140
1,1,2,2-Tetrachloroethane	5.00	5.45	109	60--140

## ----- SURROGATE RECOVERY REPORT -----

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	9.82	98	80--120
Toluene d8	10.0	9.64	96	80--120
p-Bromofluorobenzene	10.0	9.58	96	80--120

REPORT COMMENTS: None

Analyst: 

Reviewing Supervisor: 



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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52436-2 fs  
Date : 5/26/99

### GENERAL INFORMATION:

Laboratory No. : 99-52436-2  
Sample Type : WATER  
Sample Point : 140101-1681  
Sample Date : 5/11/99  
Sample Time :  
Sample Received : 5/11/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	30	5/13/99
Nitrate plus Nitrite as N.....(mg/l).....	0.50	5/13/99
Ferrous Iron.....(mg/l).....	0.4	5/12/99
Methane in headspace.....(ppm).....	4 (1)	5/12/99

(1) Headspace in vial = 10 ml. Volume of water in vial = 33 ml.



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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52436-5 fs  
Date : 5/26/99

### GENERAL INFORMATION:

Laboratory No. : 99-52436-5  
Sample Type : WATER  
Sample Point : 140101-1682  
Sample Date : 5/11/99  
Sample Time :  
Sample Received : 5/11/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	35	5/13/99
Nitrate plus Nitrite as N.....(mg/l).....	0.56	5/13/99
Ferrous Iron.....(mg/l).....	<0.1	5/12/99
Methane in headspace.....(ppm).....	13 (1)	5/12/99

(1) Headspace in vial = 10 ml. Volume of water in vial = 33 ml.





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## LABORATORY REPORT

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52436-3 fs  
Date : 5/26/99

### GENERAL INFORMATION:

Laboratory No. : 99-52436-3  
Sample Type : WATER  
Sample Point : 140101-1683  
Sample Date : 5/11/99  
Sample Time :  
Sample Received : 5/11/99

### LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	35	5/13/99
Nitrate plus Nitrite as N.....(mg/l).....	0.63	5/13/99
Ferrous Iron.....(mg/l).....	<0.1	5/12/99
Methane in headspace.....(ppm).....	5 (1)	5/12/99

(1) Headspace in vial = 10 ml. Volume of water in vial = 33 ml.

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**LABORATORY REPORT**

Page: 1

To : Envirocon, Inc.  
Address : M. McKinsey  
P.O. Box 16655  
Missoula, MT 59808

Lab No. : 99-52436-4 fs  
Date : 5/26/99

GENERAL INFORMATION:

Laboratory No. : 99-52436-4  
Sample Type : WATER  
Sample Point : 140101-1684  
Sample Date : 5/11/99  
Sample Time :  
Sample Received : 5/11/99

LABORATORY DATA:

	Result	Date Analyzed
Sulfate.....(mg/l).....	41	5/13/99
Nitrate plus Nitrite as N.....(mg/l).....	0.70	5/13/99
Ferrous Iron.....(mg/l).....	1.6	5/12/99
Methane in headspace.....(ppm).....	49 (1)	5/12/99

(1) Headspace in vial = 10 ml. Volume of water in vial = 33 ml.

Lab Nos. 99-52436-2-5

QUALITY ASSURANCE DATA PACKAGE

This report includes the results of quality assurance tests performed with the sample analyses. They are performed to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate and precise results.

<u>Constituents</u>	<u>Duplicate Analysis</u>		<u>Spiked</u>	<u>Blank</u> <u>Analysis,</u> <u>mg/l (ppm)</u>	<u>Sample</u> <u>Analysis,</u> <u>mg/l (ppm)</u>	<u>-----Calibration Verification-----</u>	<u>Date</u> <u>Analyzed</u>
	<u>-----mg/l (ppm)-----</u> <u>Original</u>	<u>Duplicate</u>	<u>Analysis,</u> <u>%</u> <u>Recovery</u>			<u>Acceptance</u> <u>Range,</u> <u>mg/l (ppm)</u>	
Sulfate	32	31	99	< 1	51	45-55	05/13/99
Nitrate plus Nitrite as N	11.2	11.1	108	< 0.05	2.34	2.04-2.56	05/13/99
Ferrous Iron	0.4	0.4	97	< 0.1	2.0	1.8-2.2	05/12/99
Methane	N/A	N/A	N/A	< 1	13	13-15	05/12/99

Date: 11-MAY-99

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

## SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal	<u>Yes</u>	Comments: _____
Intact	<u>Yes</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>Yes</u>	Comments: _____
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>Yes</u>	Comments: _____
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>Yes</u>	Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 150 736 738 9

Additional comments: \_\_\_\_\_

[illegible]





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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

May 25, 1999

Bill  
Envirocon, Inc.  
P.O. Box 16655  
Missoula, MT 59808

Dear Bill:

On May 18, 1999, this sample, represented by our laboratory numbers 001-99-52668, was submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by:

A handwritten signature in black ink, appearing to read "Wy Rippi", written over a horizontal line.

## **APPENDIX B**

### **DATA VALIDATION REPORT FOR GROUND WATER ANALYSES**



# DATA VALIDATION REPORT FOR GROUND WATER ANALYSES DECEMBER 1998 AND MAY 1999 SAMPLING ROUNDS

## 1.0 INTRODUCTION

Ground water analytical data validation levels have been established in accordance with criteria described in Appendix 1.A, Volume V of the Final Remedial Investigation Report (Envirocon, 1994). Data validation levels and codes for the Livingston Rail Yard project are based on the U.S. Environmental Protection Agency Region VIII guidance, "Evaluation Criteria for Existing Data From CERCLA Study Areas," Revision 1, January 5, 1985. Table 1.0 lists samples collected during the December 1998 and May 1999 sampling rounds.

**Table 1.0  
December 1998 and May 1999 Ground Water Samples**

Sample Number	Sample Location	Laboratory ID	Sample Date	Analyses
140101-1637	L-87-8	98-78709	12/14/98	601
140101-1638	94-1	98-78710	12/15/98	601
140101-1639	89-2	98-78714	12/16/98	NAP
140101-1640	89-4	98-78711	12/16/98	601
140101-1641	90-3	98-78712	12/16/98	601
140101-1642	94-2	98-78713	12/16/98	601
140101-1643	92-2	98-78895	12/16/98	601
140101-1644	L-87-5	98-78896	12/16/98	601
140101-1645	Trip blank	98-78897	12/17/98	601
140101-1646	92-1	98-78898	12/17/98	601
140101-1647	L-88-10	98-78899	12/17/98	601, NAP
140101-1648	L-87-2	98-79081	12/17/98	601, NAP
140101-1649	89-9	98-79082	12/17/99	601
140101-1650	89-9 dupl.	98-79083	12/17/98	601
140101-1651	89-3	98-79084	12/17/98	601
140101-1652	89-6	001-99-52195	5/3/99	601
140101-1653	89-10	002-99-52195	5/3/99	601
140101-1654	89-4	003-99-52195	5/3/99	601
140101-1655	92-4	004-99-52195	5/3/99	601
140101-1656	89-2	005-99-52195	5/4/99	601, NAP
140101-1657	L-87-3	006-99-52195	5/4/99	601, NAP
140101-1658	L-87-2	007-99-52195	5/4/99	601, NAP
140101-1659	L-88-13	008-99-52195	5/4/99	601, NAP
140101-1660	L-88-10	009-99-52195	5/4/99	601, NAP
140101-1661	L-88-9	99-5219510	5/4/99	NAP
140101-1662	4	001-99-52245	5/4/99	601
140101-1663	4 dupl.	002-99-52245	5/4/99	601
140101-1664	5	003-99-52245	5/4/99	601
140101-1665	6	004-99-52245	5/4/99	601
140101-1666	L-87-8	006-99-52245	5/5/99	601, NAP
140101-1667	L-87-7	007-99-52245	5/5/99	601, NAP
140101-1668	1	005-99-52245	5/5/99	601
140101-1669	2	008-99-52245	5/5/99	601, NAP
140101-1670	3	009-99-52245	5/4/99	601, NAP
140101-1671	LS-11	001-99-52345	5/6/99	601
140101-1672	Trip Blank	002-99-52345	5/6/99	601
140101-1673	90-3	003-99-52345	5/6/99	601
140101-1674	94-2	004-99-52345	5/6/99	601
140101-1675	92-2	005-99-52345	5/6/99	601
140101-1676	94-1	006-99-52345	5/6/99	624
140101-1677	B Street Well	009-99-52345	5/7/99	524.2
140101-1678	89-9	007-99-52345	5/7/99	601
140101-1679	89-9 dupl.	008-99-52345	5/7/99	601
140101-1680	89-3	001-99-52436	5/10/99	601
140101-1681	L-87-1	99-52436-2	5/11/99	NAP
140101-1682	L-87-4	005-99-52436	5/11/99	601, NAP
140101-1683	92-3	99-52436-3	5/11/99	NAP
140101-1684	95-1	99-52436-4	5/11/99	NAP

## 2.0 Evaluation of Blank Analyses

Laboratory and field blanks were analyzed for these sampling rounds as summarized on Table 2.0. All of the field blanks were trip blanks, whereas all of the laboratory blanks were reagent blanks.

**Table 2.0**  
**Field and Laboratory Blanks**

<u>Sample Number</u>	<u>Sample Type</u>	<u>Laboratory ID #</u>	<u>Sample Date</u>	<u>EPA Method</u>
140101-1645	Trip Blank	98-78897	12/17/98	601
N/A	Reagent Blank	N/A	12/25/98	601
N/A	Reagent Blank	N/A	12/31/98	601
N/A	Reagent Blank	N/A	5/12/99	601
N/A	Reagent Blank	N/A	5/13/99	601
N/A	Reagent Blank	N/A	5/14/99	601
140101-1672	Trip Blank	002-99-52345	5/6/99	601

No compounds were detected in any of the trip blanks or in any of the laboratory reagent blanks. Therefore, no changes to the validation levels of primary samples are necessary due to blank analyses.

## 3.0 Evaluation of Duplicate Analyses

Three sets of field duplicates and three sets of laboratory duplicates were analyzed during the December 1998 and May 1999 sampling rounds. Table 3.0 summarizes the sample numbers and dates of the duplicate samples.

One analyte in one of the duplicate pairs (PCE in Samples No. -1678 & 9) exceeded a relative percent difference of 30%. Therefore, the analyte PCE will be validated as "qualitative" for this sample pair; all other analytes remain "quantitative" with respect to duplicate analyses.

**Table 3.0**  
**Duplicate Sample Analyses**

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Type</u>	<u>Laboratory ID #</u>	<u>Sample Date</u>	<u>EPA Method</u>
140101-1642	94-2	Primary Sample	98-78713	12/16/98	601
140101-1642	94-2	Lab Duplicate	98-78713	12/16/98	601
140101-1649	89-9	Primary Sample	98-79082	12/17/98	601
140101-1650	89-9	Field Duplicate	98-79083	12/17/98	601
140101-1659	L-88-13	Primary Sample	008-99-52195	5/4/99	601
140101-1659	L-88-13	Lab Duplicate	008-99-52195	5/4/99	601
140101-1662	4	Primary Sample	001-99-52245	5/4/99	601
140101-1663	4	Field Duplicate	002-99-52245	5/4/99	601
140101-1663	4	Lab Duplicate	002-99-52245	5/4/99	601
140101-1678	89-9	Primary Sample	007-99-52345	5/7/99	601
140101-1679	89-9	Field Duplicate	008-99-52345	5/7/99	601



#### 4.0 EVALUATION OF HOLDING TIMES

All of the samples analyzed by EPA Methods 601 and 524.2 were preserved by being acidified to pH values below 2.0. Properly preserved samples for analysis by EPA Methods 601/624 and 524.2 can be stored for up to 14 days prior to analysis. A review of all holding times revealed that none of these samples exceeded the 14-day holding period for VOCs. However, the ferrous iron holding time of 24-hours was exceeded for Sample No. -1648. This analyte will be downgraded to qualitative status.

#### 5.0 EVALUATION OF MATRIX, BLANK, AND SURROGATE SPIKE RESULTS

All matrix spike, blank spike, and surrogate spike recoveries were within acceptable limits except for a single surrogate spike recovery (1,2-DCE) in Sample No. -1677. The analyte associated with this surrogate is cis-1,2-DCE; it will be downgraded to "qualitative" status for this sample.

All U.S. EPA water supply quality control samples were within recovery limits. Matrix spike, surrogate spike, and U.S. EPA water supply quality control sample results are provided in Appendix A of this report.

#### 6.0 MISCELLANEOUS QA/QC EVALUATIONS

(None)

#### 7.0 VALIDATION LEVEL ASSIGNMENTS

All analytical results for the December 1998 and May 1999 sampling rounds are acceptable as quantitative data (code 'B'), except those listed on Table 4.0, which have been downgraded to qualitative status (code 'A').

**TABLE 4**  
**Analytical Results Degraded to Qualitative Status**

<u>Sample Location</u>	<u>Sample Date</u>	<u>Sample Number</u>	<u>Chemical Name</u>	<u>Conc. (mg/l)</u>	<u>Validation Qualifier</u>	<u>Reason</u>
L-87-2	12/17/98	-1648	ferrous iron	1.3	A	holding time
B-St Well	5/7/99	-1677	cis-1,2-DCE	<0.5	A	surrogate
89-9	5/7/99	-1678	PCE	41	A	dupl. RPD
89-9 dupl.	5/7/99	-1679	PCE	65	A	dupl. RPD



## **APPENDIX C**

### **Analytical Results for Private Wells East of the Yellowstone River**



**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 15-OCT-98 11:00  
Date Received: 15-OCT-98  
Analysis Date: 19-OCT-1998 19:29  
File: /chem/IONTRAP2.1/vc101998.b/9867698a.d  
Project Info: Proj. #140101, BN-Livingston  
Sample Info: O'Hara

Lab No.: 98-67698  
Report Date: 10/22/98 09:07  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT**

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
-----------	---------	---------	--------	-----------

**-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----**

Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	1.5	
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

**-----REGULATED VOC'S: TRIHALOMETHANES-----**

Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U

**-----OTHER EPA LISTED VOC'S-----**

Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

report continued on page 2)



EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Methyl-t-butyl ether	1634-04-4	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
Trichlorofluoromethane	75-69-4	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	8.35	84	80--120
Toluene d8	10.0	9.33	93	80--120
p-Bromofluorobenzene	10.0	9.86	99	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: 710x Reviewing Supervisor: MB

Client: Envirocon, Inc.  
 Date Sampled: 15-OCT-98 11:00  
 Date Received: 15-OCT-98  
 Analysis Date: 20-OCT-1998 12:15  
 File: /chem/IONTRAP2.1/vc102098.b/9867698b.d  
 Project Info: Proj. #140101, BN-Livingston  
 Sample Info: O'Hara

Lab No.: 98-67698 Duplicate  
 Report Date: 10/22/98 10:58  
 Extraction Method: EPA 5030  
 Sample Matrix: WATER; pH= < 2

**EPA METHOD 524.2  
 VOLATILE ORGANICS ANALYSIS REPORT  
 =====**

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	1.9	
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

Sample Info: O'Hara

**EPA METHOD 524.2**  
**VOLATILE ORGANICS ANALYSIS REPORT (continued)**

=====				
COMPOUNDS	CAS NO.	EPA MCL	CONCENTRATION UNITS = ug/L (ppb)	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Methyl-t-butyl ether	1634-04-4	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
Trichlorofluoromethane	75-69-4	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

----- SURROGATE RECOVERY REPORT -----				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.06	81	80--120
Toluene d8	10.0	9.26	93	80--120
p-Bromofluorobenzene	10.0	10.4	104	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicatee compound was analyzed for but not detected.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: hjc      Reviewing Supervisor: mmj



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Client: Envirocon, Inc.  
Date Sampled: 15-OCT-98 11:30  
Date Received: 15-OCT-98  
Analysis Date: 19-OCT-1998 20:12  
File: /chem/IONTRAP2.1/vc101998.1/9867699a.d  
Project Info: Proj. #140101, BN-Livingston  
Sample Info: Park Lumber

Lab No.: 98-67699  
Report Date: 10/22/98 09:07  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

**EPA METHOD 524.2**  
**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	0.38J
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)

Sample Info: Park Lumber

**EPA METHOD 524.2**  
**VOLATILE ORGANICS ANALYSIS REPORT (continued)**  
 =====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Methyl-t-butyl ether	1634-04-4	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
Trichlorofluoromethane	75-69-4	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.28	83	80--120
Toluene d8	10.0	9.48	95	80--120
p-Bromofluorobenzene	10.0	9.98	100	80--120

## QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

 Analyst: 702      Reviewing Supervisor: 703



Client: Envirocon, Inc.  
 Date Sampled: 15-OCT-98 11:30  
 Date Received: 15-OCT-98  
 Analysis Date: 20-OCT-1998 12:57  
 File: /chem/IONTRAP2.1/vc102098.b/9867699b.d  
 Project Info: Proj. #140101, BN-Livingston  
 Sample Info: Park Lumber

Lab No.: 98-67699 Duplicate  
 Report Date: 10/22/98 10:58  
 Extraction Method: EPA 5030  
 Sample Matrix: WATER; pH= < 2

**EPA METHOD 524.2**  
**VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----				
Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	0.39J
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U
-----REGULATED VOC'S: TRIHALOMETHANES-----				
Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U
-----OTHER EPA LISTED VOC'S-----				
Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropene	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Methyl-t-butyl ether	1634-04-4	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
Trichlorofluoromethane	75-69-4	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.13	81	80--120
Toluene d8	10.0	9.49	95	80--120
p-Bromofluorobenzene	10.0	10.5	105	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

J= Estimated value. Present, but less than the limit of quantitation.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: HJC

Reviewing Supervisor: MJ

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FAX (406) 252-6069 • 1-800 735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.

Date Sampled: 15-OCT-98 11:45

Date Received: 15-OCT-98

Analysis Date: 19-OCT-1998 20:55

File: /chem/IONTRAP2.1/vc101998.b/9867700a.d

Project Info: Proj. #140101, BN-Livingston

Sample Info: Myrsto1

Lab No.: 98-67700

Report Date: 10/22/98 09:07

Extraction Method: EPA 5030

Sample Matrix: WATER, pH= &lt; 2

**EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT**

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
-----------	---------	---------	--------	-----------

=====	=====	=====	=====	=====
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**-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----**

Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

**-----REGULATED VOC'S: TRIHALOMETHANES-----**

Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U

**-----OTHER EPA LISTED VOC'S-----**

Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)



EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT (continued)

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Methyl-t-butyl ether	1634-04-4	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
Trichlorofluoromethane	75-69-4	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.18	82	80--120
Toluene d8	10.0	9.71	97	80--120
p-Bromofluorobenzene	10.0	10.6	106	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: 70jc      Reviewing Supervisor: OM3

Quality Control Sample: Laboratory Reagent Blank 19-OCT-1998 13:58

Report Date: 10/22/98 09:06

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.1/vc101998.b/blk1019a.d

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 524.2  
VOLATILE ORGANICS ANALYSIS REPORT

=====

CONCENTRATION UNITS = ug/L (ppb)

COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====

-----REGULATED VOLATILE ORGANIC CHEMICALS (VOC'S)-----

Benzene	71-43-2	5	<0.50	U
Carbon Tetrachloride	56-23-5	5	<0.50	U
Chlorobenzene	108-90-7	100	<0.50	U
1,2-Dichlorobenzene	95-50-1	600	<0.50	U
1,4-Dichlorobenzene	106-46-7	75	<0.50	U
1,2-Dichloroethane	107-06-2	5	<0.50	U
1,1-Dichloroethene	75-35-4	7	<0.50	U
cis-1,2-Dichloroethene	156-59-2	70	<0.50	U
trans-1,2-Dichloroethene	156-60-5	100	<0.50	U
1,2-Dichloropropane	78-87-5	5	<0.50	U
Ethylbenzene	100-41-4	700	<0.50	U
Methylene Chloride	75-09-2	5	<0.50	U
Styrene	100-42-5	100	<0.50	U
Tetrachloroethene	127-18-4	5	<0.50	U
Toluene	108-88-3	1000	<0.50	U
1,2,4-Trichlorobenzene	120-82-1	70	<0.50	U
1,1,1-Trichloroethane	71-55-6	200	<0.50	U
1,1,2-Trichloroethane	79-00-5	5	<0.50	U
Trichloroethene	79-01-6	5	<0.50	U
Vinyl Chloride	75-01-4	2	<0.50	U
m+p-Xylenes	108383/106423		<0.50	U
o-Xylene	95-47-6		<0.50	U
Total Xylenes		10000	<0.50	U

-----REGULATED VOC'S: TRIHALOMETHANES-----

Bromodichloromethane	75-27-4	Total	<0.50	U
Bromoform	75-25-2	of all	<0.50	U
Chlorodibromomethane	124-48-1	four	<0.50	U
Chloroform	67-66-3	100	<0.50	U

-----OTHER EPA LISTED VOC'S-----

Bromobenzene	108-86-1	NR	<0.50	U
Bromochloromethane	74-97-5	NR	<0.50	U
Bromomethane	74-83-9	NR	<0.50	U
n-Butylbenzene	104-51-8	NR	<0.50	U
sec-Butylbenzene	135-98-8	NR	<0.50	U
tert-Butylbenzene	98-06-6	NR	<0.50	U
Chloroethane	75-00-3	NR	<0.50	U
Chloromethane	74-87-3	NR	<0.50	U
2-Chlorotoluene	95-49-8	NR	<0.50	U
4-Chlorotoluene	106-43-4	NR	<0.50	U
1,2-Dibromo-3-chloropropane	96-12-8	NA	<0.50	U

(report continued on page 2)



**EPA METHOD 524.2**  
**VOLATILE ORGANICS ANALYSIS REPORT (continued)**  
 =====

CONCENTRATION UNITS = ug/L (ppb)				
COMPOUNDS	CAS NO.	EPA MCL	RESULT	QUALIFIER
=====	=====	=====	=====	=====
1,2-Dibromoethane	106-93-4	NA	<0.50	U
Dibromomethane	74-95-3	NR	<0.50	U
1,3-Dichlorobenzene	541-73-1	NR	<0.50	U
Dichlorodifluoromethane	75-71-8	NR	<0.50	U
1,1-Dichloroethane	75-34-3	NR	<0.50	U
1,1-Dichloropropene	563-58-6	NR	<0.50	U
1,3-Dichloropropane	142-28-9	NR	<0.50	U
cis-1,3-Dichloropropene	10061-01-5	NR	<0.50	U
trans-1,3-Dichloropropene	10061-02-6	NR	<0.50	U
2,2-Dichloropropane	594-20-7	NR	<0.50	U
Hexachlorobutadiene	87-68-3	NR	<0.50	U
Isopropylbenzene	98-82-8	NR	<0.50	U
p-Isopropyltoluene	99-87-6	NR	<0.50	U
Methyl-t-butyl ether	1634-04-4	NR	<0.50	U
Naphthalene	91-20-3	NR	<0.50	U
n-Propylbenzene	103-65-1	NR	<0.50	U
1,1,1,2-Tetrachloroethane	630-20-6	NR	<0.50	U
1,1,2,2-Tetrachloroethane	79-34-5	NR	<0.50	U
1,2,3-Trichlorobenzene	87-61-6	NR	<0.50	U
Trichlorofluoromethane	75-69-4	NR	<0.50	U
1,2,3-Trichloropropane	96-18-4	NR	<0.50	U
1,2,4-Trimethylbenzene	95-63-6	NR	<0.50	U
1,3,5-Trimethylbenzene	108-67-8	NR	<0.50	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.24	82	80--120
Toluene d8	10.0	9.73	97	80--120
p-Bromofluorobenzene	10.0	11.0	110	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

NR= No currently regulated amount.

NA= Not applicable to this method. Concentrations are presented for screening purposes. For regulatory compliance, analyze using EPA method 504 which has lower detection limits.

REPORT COMMENTS: None

Analyst: ZAC      Reviewing Supervisor: MT3

# EPA METHOD 524.2 BLANK SPIKE REPORT

=====

Quality Control Sample: Reference Sample Analysis 14-OCT-1998 10:24

Report Date: 10/19/98 09:26

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /chem/IONTRAP2.i/vc101498.b/qcs1014a.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

## CONCENTRATION UNITS = ug/L (ppb)

Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Bromodichloromethane	5.00	4.98	100	60--140
Bromoform	5.00	4.77	95	60--140
Chlorodibromomethane	5.00	5.24	105	60--140
Chloroform	5.00	4.90	98	60--140

## SURROGATE RECOVERY REPORT

Surrogate Compound	Added ug/L	Measured ug/L	%Rec	QC Limits
=====	=====	=====	=====	=====
1,2-Dichloroethane d4	10.0	8.95	89	80--120
Toluene d8	10.0	9.73	97	80--120
p-Bromofluorobenzene	10.0	9.86	99	80--120

REPORT COMMENTS: None

Analyst:   HJC   Reviewing Supervisor:   MB

Lab Nos.: 98-67698 - 98-67700

Date: 15-OCT-98

Received by: Randa Hoelscher

Logged In by: Randa Hoelscher

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form Completed & Signed	<u>Yes</u>	Comments: _____
Chain of Custody Seal	<u>Yes</u>	Comments: _____
Intact	<u>Yes</u>	Comments: _____
Signature Match Chain of Custody vs. Seal	<u>Yes</u>	Comments: _____
Samples Received Cold	<u>Yes</u>	Comments: _____
Samples Received Within Holding Time	<u>Yes</u>	Comments: _____
Samples Received in Proper Containers	<u>Yes</u>	Comments: _____
Samples Received Properly Preserved	<u>N/A</u>	Comments: _____

Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Greyhound 130 359 663 5

Additional comments: \_\_\_\_\_

[illegible]



**ENERGY LABORATORIES, INC.**

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

October 27, 1998

John Mills  
Envirocon, Inc.  
P.O. Box 16655  
Missoula, MT 59808

Dear John:

On October 15, 1998, these samples, represented by our laboratory numbers 98-67698 through 98-67700, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by:

A handwritten signature in black ink, appearing to read "Deborah A. Grinn", written over a horizontal line.





# ENERGY LABORATORIES, INC

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL: eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 28-SEP-99 14:00  
Date Received: 29-SEP-99  
Analysis Date: 04-OCT-1999 20:33  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: YELLOWSTONE VET

Lab No.: 001-99-57415  
Report Date: 10/11/99 14:11  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
Benzene	71-43-2		<1.0	U
Bromobenzene	108-86-1		<1.0	U
Bromochloromethane	74-97-5		<1.0	U
Bromodichloromethane	75-27-4		<1.0	U
Bromoform	75-25-2		<1.0	U
Bromomethane	74-83-9		<1.0	U, 1
Carbon tetrachloride	56-23-5		<1.0	U
Chlorobenzene	108-90-7		<1.0	U
Chloroethane	75-00-3		<1.0	U
2-Chloroethylvinyl ether	110-75-8		<1.0	U
Chloroform	67-66-3		<1.0	U
Chloromethane	74-87-3		<1.0	U
2-Chlorotoluene	95-49-8		<1.0	U
4-Chlorotoluene	106-43-4		<1.0	U
Chlorodibromomethane	124-48-1		<1.0	U
1,2-Dibromoethane	106-93-4		<1.0	U
Dibromomethane	74-95-3		<1.0	U
1,2-Dichlorobenzene	95-50-1		<1.0	U
1,3-Dichlorobenzene	541-73-1		<1.0	U
1,4-Dichlorobenzene	106-46-7		<1.0	U
Dichlorodifluoromethane	75-71-8		<1.0	U
1,1-Dichloroethane	75-34-3		<1.0	U
1,2-Dichloroethane	107-06-2		<1.0	U
1,1-Dichloroethene	75-35-4		<1.0	U
cis-1,2-Dichloroethene	156-59-2		<1.0	U
trans-1,2-Dichloroethene	156-60-5		<1.0	U
1,2-Dichloropropane	78-87-5		<1.0	U
1,3-Dichloropropane	142-28-9		<1.0	U
2,2-Dichloropropane	594-20-7		<1.0	U
1,1-Dichloropropene	563-58-6		<1.0	U
cis-1,3-Dichloropropene	10061-01-5		<1.0	U
trans-1,3-Dichloropropene	10061-02-6		<1.0	U
Ethylbenzene	100-41-4		<1.0	U
Methyl-t-butyl ether	1634-04-4		<1.0	U
Methylene chloride	75-09-2		<1.0	U
Methyl ethyl ketone	78-93-3		<20	U
Styrene	100-42-5		<1.0	U
1,1,1,2-Tetrachloroethane	630-20-6		<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5		<1.0	U
Tetrachloroethene	127-18-4		<1.0	U
Toluene	108-88-3		<1.0	U
1,1,1-Trichloroethane	71-55-6		<1.0	U
1,1,2-Trichloroethane	79-00-5		<1.0	U
Trichloroethene	79-01-6		<1.0	U
Trichlorofluoromethane	75-69-4		<1.0	U
1,2,3-Trichloropropane	96-18-4		<1.0	U
Vinyl chloride	75-01-4		<1.0	U
m+p-Xylenes	108383/106423		<1.0	U
o-Xylene	95-47-6		<1.0	U

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	10.3	103	80--120
Toluene d8	10.0	11.1	111	80--120
p-Bromofluorobenzene	10.0	11.1	111	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

1= The recovery for this compound in the continuing calibration verification was below the laboratory standard operating procedure QC advisory limit.

REPORT COMMENTS: None

Analyst: [Signature] Reviewing Supervisor: [Signature] /IONTRAP1.1/vb100499.b/14oct04.d

**ENERGY LABORATORIES, INC.**P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6325  
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.comClient: Envirocon, Inc.  
Date Sampled: 28-SEP-99 14:15  
Date Received: 29-SEP-99  
Analysis Date: 04-OCT-99 21:12  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: HILMANLab No.: 002-99-57415  
Report Date: 10/11/99 14:11  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2**EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT**

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
Benzene	71-43-2		<1.0	U
Bromobenzene	108-86-1		<1.0	U
Bromochloromethane	74-97-5		<1.0	U
Bromodichloromethane	75-27-4		<1.0	U
Bromoform	75-25-2		<1.0	U
Bromomethane	74-83-9		<1.0	U, 1
Carbon tetrachloride	56-23-5		<1.0	U
Chlorobenzene	108-90-7		<1.0	U
Chloroethane	75-00-3		<1.0	U
2-Chloroethylvinyl ether	110-75-8		<1.0	U
Chloroform	67-66-3		<1.0	U
Chloromethane	74-87-3		<1.0	U
2-Chlorotoluene	95-49-8		<1.0	U
4-Chlorotoluene	106-43-4		<1.0	U
Chlorodibromomethane	124-48-1		<1.0	U
1,2-Dibromoethane	106-93-4		<1.0	U
Dibromomethane	74-95-3		<1.0	U
1,2-Dichlorobenzene	95-50-1		<1.0	U
1,3-Dichlorobenzene	541-73-1		<1.0	U
1,4-Dichlorobenzene	106-46-7		<1.0	U
Dichlorodifluoromethane	75-71-8		<1.0	U
1,1-Dichloroethane	75-34-3		<1.0	U
1,2-Dichloroethane	107-06-2		<1.0	U
1,1-Dichloroethene	75-35-4		<1.0	U
cis-1,2-Dichloroethene	156-59-2		<1.0	U
trans-1,2-Dichloroethene	156-60-5		<1.0	U
1,2-Dichloropropane	78-87-5		<1.0	U
1,3-Dichloropropane	142-28-9		<1.0	U
2,2-Dichloropropane	594-20-7		<1.0	U
1,1-Dichloropropene	563-58-6		<1.0	U
cis-1,3-Dichloropropene	10061-01-5		<1.0	U
trans-1,3-Dichloropropene	10061-02-6		<1.0	U
Ethylbenzene	100-41-4		<1.0	U
Methyl-t-butyl ether	1634-04-4		<1.0	U
Methylene chloride	75-09-2		<1.0	U
Methyl ethyl ketone	78-93-3		<20	U
Styrene	100-42-5		<1.0	U
1,1,1,2-Tetrachloroethane	630-20-6		<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5		<1.0	U
Tetrachloroethene	127-18-4		<1.0	U
Toluene	108-88-3		<1.0	U
1,1,1-Trichloroethane	71-55-6		<1.0	U
1,1,2-Trichloroethane	79-00-5		<1.0	U
Trichloroethene	79-01-6		<1.0	U
Trichlorofluoromethane	75-69-4		<1.0	U
1,2,3-Trichloropropane	96-18-4		<1.0	U
Vinyl chloride	75-01-4		<1.0	U
m+p-Xylenes	108383/106423		<1.0	U
o-Xylene	95-47-6		<1.0	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.98	100	80--120
Toluene d8	10.0	10.9	109	80--120
p-Bromofluorobenzene	10.0	10.8	108	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

U= Indicates compound was analyzed for but not detected.

1= The recovery for this compound in the continuing calibration verification was below the laboratory standard operating procedure QC advisory limit.

REPORT COMMENTS: None

Analyst: [Signature] Reviewing Supervisor: [Signature]

/IONTRAP1.i/vb100499.b/15oct04.d



# ENERGY LABORATORIES, INC.

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 28-SEP-99 14:35  
Date Received: 29-SEP-99  
Analysis Date: 04-OCT-99 21:52  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: FRIDLEY

Lab No.: 003-99-57415  
Report Date: 10/11/99 14:12  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
Benzene	71-43-2		<1.0	U
Bromobenzene	108-86-1		<1.0	U
Bromochloromethane	74-97-5		<1.0	U
Bromodichloromethane	75-27-4		<1.0	U
Bromoform	75-25-2		<1.0	U
Bromomethane	74-83-9		<1.0	U,1
Carbon tetrachloride	56-23-5		<1.0	U
Chlorobenzene	108-90-7		<1.0	U
Chloroethane	75-00-3		<1.0	U
2-Chloroethylvinyl ether	110-75-8		<1.0	U
Chloroform	67-66-3		<1.0	U
Chloromethane	74-87-3		<1.0	U
2-Chlorotoluene	95-49-8		<1.0	U
4-Chlorotoluene	106-43-4		<1.0	U
Chlorodibromomethane	124-48-1		<1.0	U
1,2-Dibromoethane	106-93-4		<1.0	U
Dibromomethane	74-95-3		<1.0	U
1,2-Dichlorobenzene	95-50-1		<1.0	U
1,3-Dichlorobenzene	541-73-1		<1.0	U
1,4-Dichlorobenzene	106-46-7		<1.0	U
Dichlorodifluoromethane	75-71-8		<1.0	U
1,1-Dichloroethane	75-34-3		<1.0	U
1,2-Dichloroethane	107-06-2		<1.0	U
1,1-Dichloroethene	75-35-4		<1.0	U
cis-1,2-Dichloroethene	156-59-2		<1.0	U
trans-1,2-Dichloroethene	156-60-5		<1.0	U
1,2-Dichloropropane	78-87-5		<1.0	U
1,3-Dichloropropane	142-28-9		<1.0	U
2,2-Dichloropropane	594-20-7		<1.0	U
1,1-Dichloropropene	563-58-6		<1.0	U
cis-1,3-Dichloropropene	10061-01-5		<1.0	U
trans-1,3-Dichloropropene	10061-02-6		<1.0	U
Ethylbenzene	100-41-4		<1.0	U
Methyl-t-butyl ether	1634-04-4		<1.0	U
Methylene chloride	75-09-2		<1.0	U
Methyl ethyl ketone	78-93-3		<20	U
Styrene	100-42-5		<1.0	U
1,1,1,2-Tetrachloroethane	630-20-6		<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5		<1.0	U
Tetrachloroethene	127-18-4		<1.0	U
Toluene	108-88-3		<1.0	U
1,1,1-Trichloroethane	71-55-6		<1.0	U
1,1,2-Trichloroethane	79-00-5		<1.0	U
Trichloroethene	79-01-6		<1.0	U
Trichlorofluoromethane	75-69-4		<1.0	U
1,2,3-Trichloropropane	96-18-4		<1.0	U
Vinyl chloride	75-01-4		<1.0	U
m+p-Xylenes	108383/106423		<1.0	U
o-Xylene	95-47-6		<1.0	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.81	98	80--120
Toluene d8	10.0	11.0	110	80--120
p-Bromofluorobenzene	10.0	10.5	105	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

1= The recovery for this compound in the continuing calibration verification was below the laboratory standard operating procedure QC advisory limit.

REPORT COMMENTS: None

Analyst: [Signature] Reviewing Supervisor: [Signature] /IONTRAP1.i/vb100499.b/16oct04.d





# ENERGY LABORATORIES, INC.

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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 28-SEP-99 15:00  
Date Received: 29-SEP-99  
Analysis Date: 04-OCT-99 22:30  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: HUMANE SOCIETY

Lab No.: 004-99-57415  
Report Date: 10/11/99 14:13  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
Benzene	71-43-2		<1.0	U
Bromobenzene	108-86-1		<1.0	U
Bromochloromethane	74-97-5		<1.0	U
Bromodichloromethane	75-27-4		<1.0	U
Bromoform	75-25-2		<1.0	U
Bromomethane	74-83-9		<1.0	U,1
Carbon tetrachloride	56-23-5		<1.0	U
Chlorobenzene	108-90-7		<1.0	U
Chloroethane	75-00-3		<1.0	U
2-Chloroethylvinyl ether	110-75-8		<1.0	U
Chloroform	67-66-3		<1.0	U
Chloromethane	74-87-3		<1.0	U
2-Chlorotoluene	95-49-8		<1.0	U
4-Chlorotoluene	106-43-4		<1.0	U
Chlorodibromomethane	124-48-1		<1.0	U
1,2-Dibromoethane	106-93-4		<1.0	U
Dibromomethane	74-95-3		<1.0	U
1,2-Dichlorobenzene	95-50-1		<1.0	U
1,3-Dichlorobenzene	541-73-1		<1.0	U
1,4-Dichlorobenzene	106-46-7		<1.0	U
Dichlorodifluoromethane	75-71-8		<1.0	U
1,1-Dichloroethane	75-34-3		<1.0	U
1,2-Dichloroethane	107-06-2		<1.0	U
1,1-Dichloroethene	75-35-4		<1.0	U
cis-1,2-Dichloroethene	156-59-2		<1.0	U
trans-1,2-Dichloroethene	156-60-5		<1.0	U
1,2-Dichloropropane	78-87-5		<1.0	U
1,3-Dichloropropane	142-28-9		<1.0	U
2,2-Dichloropropane	594-20-7		<1.0	U
1,1-Dichloropropene	563-58-6		<1.0	U
cis-1,3-Dichloropropene	10061-01-5		<1.0	U
trans-1,3-Dichloropropene	10061-02-6		<1.0	U
Ethylbenzene	100-41-4		<1.0	U
Methyl-t-butyl ether	1634-04-4		<1.0	U
Methylene chloride	75-09-2		<1.0	U
Methyl ethyl ketone	78-93-3		<20	U
Styrene	100-42-5		<1.0	U
1,1,1,2-Tetrachloroethane	630-20-6		<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5		<1.0	U
Tetrachloroethene	127-18-4		<1.0	U
Toluene	108-88-3		<1.0	U
1,1,1-Trichloroethane	71-55-6		<1.0	U
1,1,2-Trichloroethane	79-00-5		<1.0	U
Trichloroethene	79-01-6		<1.0	U
Trichlorofluoromethane	75-69-4		<1.0	U
1,2,3-Trichloropropane	96-18-4		<1.0	U
Vinyl chloride	75-01-4		<1.0	U
m+p-Xylenes	108383/106423		<1.0	U
o-Xylene	95-47-6		<1.0	U

### SURROGATE RECOVERY REPORT

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.88	99	80--120
Toluene d8	10.0	10.9	109	80--120
p-Bromofluorobenzene	10.0	11.2	112	80--120

#### QUALIFIER CODE EXPLANATIONS AND NOTES:

- U= Indicates compound was analyzed for but not detected.
- 1= The recovery for this compound in the continuing calibration verification was below the laboratory standard operating procedure QC advisory limit.

REPORT COMMENTS: None

Analyst: BP

Reviewing Supervisor: nm

/IONTRAP1.i/vb100499.b/17oct04.d



# ENERGY LABORATORIES, INC.

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FAX (406) 252-6069 • 1-800-735-4489 • E MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 28-SEP-99 15:05  
Date Received: 29-SEP-99  
Analysis Date: 04-OCT-99 23:09  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: GRAYBEAL

Lab No.: 005-99-57415  
Report Date: 10/11/99 14:14  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
Benzene	71-43-2		<1.0	U
Bromobenzene	108-86-1		<1.0	U
Bromochloromethane	74-97-5		<1.0	U
Bromodichloromethane	75-27-4		<1.0	U
Bromoform	75-25-2		<1.0	U
Bromomethane	74-83-9		<1.0	U,1
Carbon tetrachloride	56-23-5		<1.0	U
Chlorobenzene	108-90-7		<1.0	U
Chloroethane	75-00-3		<1.0	U
2-Chloroethylvinyl ether	110-75-8		<1.0	U
Chloroform	67-66-3		<1.0	U
Chloromethane	74-87-3		<1.0	U
2-Chlorotoluene	95-49-8		<1.0	U
4-Chlorotoluene	106-43-4		<1.0	U
Chlorodibromomethane	124-48-1		<1.0	U
1,2-Dibromoethane	106-93-4		<1.0	U
Dibromomethane	74-95-3		<1.0	U
1,2-Dichlorobenzene	95-50-1		<1.0	U
1,3-Dichlorobenzene	541-73-1		<1.0	U
1,4-Dichlorobenzene	106-46-7		<1.0	U
Dichlorodifluoromethane	75-71-8		<1.0	U
1,1-Dichloroethane	75-34-3		<1.0	U
1,2-Dichloroethane	107-06-2		<1.0	U
1,1-Dichloroethene	75-35-4		<1.0	U
cis-1,2-Dichloroethene	156-59-2		<1.0	U
trans-1,2-Dichloroethene	156-60-5		<1.0	U
1,2-Dichloropropane	78-87-5		<1.0	U
1,3-Dichloropropane	142-28-9		<1.0	U
2,2-Dichloropropane	594-20-7		<1.0	U
1,1-Dichloropropene	563-58-6		<1.0	U
cis-1,3-Dichloropropene	10061-01-5		<1.0	U
trans-1,3-Dichloropropene	10061-02-6		<1.0	U
Ethylbenzene	100-41-4		<1.0	U
Methyl-t-butyl ether	1634-04-4		<1.0	U
Methylene chloride	75-09-2		<1.0	U
Methyl ethyl ketone	78-93-3		<20	U
Styrene	100-42-5		<1.0	U
1,1,1,2-Tetrachloroethane	630-20-6		<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5		<1.0	U
Tetrachloroethene	127-18-4		<1.0	U
Toluene	108-88-3		<1.0	U
1,1,1-Trichloroethane	71-55-6		<1.0	U
1,1,2-Trichloroethane	79-00-5		<1.0	U
Trichloroethene	79-01-6		<1.0	U
Trichlorofluoromethane	75-69-4		<1.0	U
1,2,3-Trichloropropane	96-18-4		<1.0	U
Vinyl chloride	75-01-4		<1.0	U
m+p-Xylenes	108383/106423		<1.0	U
o-Xylene	95-47-6		<1.0	U

SURROGATE RECOVERY REPORT				
Surrogate Compound	- Added-ug/L	Measured-ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.49	95	80--120
Toluene d8	10.0	11.2	112	80--120
p-Bromofluorobenzene	10.0	10.4	104	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

1= The recovery for this compound in the continuing calibration verification was below the laboratory standard operating procedure QC advisory limit.

REPORT COMMENTS: None

Analyst: PAE Reviewing Supervisor: MM /IONTRAP1.i/vb100499.b/18oct04.d



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FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL ell@energylab.comClient: Envirocon, Inc.  
Date Sampled: 28-SEP-99 15:15  
Date Received: 29-SEP-99  
Analysis Date: 04-OCT-99 23:48  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: OHARELab No.: 006-99-57415  
Report Date: 10/11/99 14:15  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2**EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT**

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
Benzene	71-43-2		<1.0	U
Bromobenzene	108-86-1		<1.0	U
Bromochloromethane	74-97-5		<1.0	U
Bromodichloromethane	75-27-4		<1.0	U
Bromoform	75-25-2		<1.0	U
Bromomethane	74-83-9		<1.0	U,1
Carbon tetrachloride	56-23-5		<1.0	U
Chlorobenzene	108-90-7		<1.0	U
Chloroethane	75-00-3		<1.0	U
2-Chloroethylvinyl ether	110-75-8		<1.0	U
Chloroform	67-66-3		<1.0	U
Chloromethane	74-87-3		<1.0	U
2-Chlorotoluene	95-49-8		<1.0	U
4-Chlorotoluene	106-43-4		<1.0	U
Chlorodibromomethane	124-48-1		<1.0	U
1,2-Dibromoethane	106-93-4		<1.0	U
Dibromomethane	74-95-3		<1.0	U
1,2-Dichlorobenzene	95-50-1		<1.0	U
1,3-Dichlorobenzene	541-73-1		<1.0	U
1,4-Dichlorobenzene	106-46-7		<1.0	U
Dichlorodifluoromethane	75-71-8		<1.0	U
1,1-Dichloroethane	75-34-3		<1.0	U
1,2-Dichloroethane	107-06-2		<1.0	U
1,1-Dichloroethene	75-35-4		<1.0	U
cis-1,2-Dichloroethene	156-59-2		<1.0	U
trans-1,2-Dichloroethene	156-60-5		<1.0	U
1,2-Dichloropropane	78-87-5		<1.0	U
1,3-Dichloropropane	142-28-9		<1.0	U
2,2-Dichloropropane	594-20-7		<1.0	U
1,1-Dichloropropene	563-58-6		<1.0	U
cis-1,3-Dichloropropene	10061-01-5		<1.0	U
trans-1,3-Dichloropropene	10061-02-6		<1.0	U
Ethylbenzene	100-41-4		<1.0	U
Methyl-t-butyl ether	1634-04-4		<1.0	U
Methylene chloride	75-09-2		<1.0	U
Methyl ethyl ketone	78-93-3		<20	U
Styrene	100-42-5		<1.0	U
1,1,1,2-Tetrachloroethane	630-20-6		<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5		<1.0	U
Tetrachloroethene	127-18-4		1.2	
Toluene	108-88-3		<1.0	U
1,1,1-Trichloroethane	71-55-6		<1.0	U
1,1,2-Trichloroethane	79-00-5		<1.0	U
Trichloroethene	79-01-6		<1.0	U
Trichlorofluoromethane	75-69-4		<1.0	U
1,2,3-Trichloropropane	96-18-4		<1.0	U
Vinyl chloride	75-01-4		<1.0	U
m+p-Xylenes	108383/106423		<1.0	U
o-Xylene	95-47-6		<1.0	U

**SURROGATE RECOVERY REPORT**

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.73	97	80--120
Toluene d8	10.0	10.8	108	80--120
p-Bromofluorobenzene	10.0	10.5	105	80--120

**QUALIFIER CODE EXPLANATIONS AND NOTES:**

- U- Indicates compound was analyzed for but not detected.
- 1- The recovery for this compound in the continuing calibration verification was below the laboratory standard operating procedure QC advisory limit.

REPORT COMMENTS: None

Analyst: [Signature] Reviewing Supervisor: [Signature] /IONTRAP1.1/vb100499.b/19oct04.d



# ENERGY LABORATORIES, INC.

P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6069 • FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

Client: Envirocon, Inc.  
Date Sampled: 28-SEP-99 15:30  
Date Received: 29-SEP-99  
Analysis Date: 05-OCT-99 00:27  
Project Info: LIVINGSTON RAIL YARD  
Sample Info: RUSTAD HOUSE

Lab No.: 007-99-57415  
Report Date: 10/11/99 14:16  
Extraction Method: EPA 5030  
Sample Matrix: WATER; pH= < 2

## EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT

COMPOUNDS	CAS NO.	CONCENTRATION UNITS = ug/L (ppb)	RESULT	QUALIFIER
Benzene	71-43-2		<1.0	U
Bromobenzene	108-86-1		<1.0	U
Bromochloromethane	74-97-5		<1.0	U
Bromodichloromethane	75-27-4		<1.0	U
Bromoform	75-25-2		<1.0	U
Bromomethane	74-83-9		<1.0	U,1
Carbon tetrachloride	56-23-5		<1.0	U
Chlorobenzene	108-90-7		<1.0	U
Chloroethane	75-00-3		<1.0	U
2-Chloroethylvinyl ether	110-75-8		<1.0	U
Chloroform	67-66-3		<1.0	U
Chloromethane	74-87-3		<1.0	U
2-Chlorotoluene	95-49-8		<1.0	U
4-Chlorotoluene	106-43-4		<1.0	U
Chlorodibromomethane	124-48-1		<1.0	U
1,2-Dibromoethane	106-93-4		<1.0	U
Dibromomethane	74-95-3		<1.0	U
1,2-Dichlorobenzene	95-50-1		<1.0	U
1,3-Dichlorobenzene	541-73-1		<1.0	U
1,4-Dichlorobenzene	106-46-7		<1.0	U
Dichlorodifluoromethane	75-71-8		<1.0	U
1,1-Dichloroethane	75-34-3		<1.0	U
1,2-Dichloroethane	107-06-2		<1.0	U
1,1-Dichloroethene	75-35-4		<1.0	U
cis-1,2-Dichloroethene	156-59-2		<1.0	U
trans-1,2-Dichloroethene	156-60-5		<1.0	U
1,2-Dichloropropane	78-87-5		<1.0	U
1,3-Dichloropropane	142-28-9		<1.0	U
2,2-Dichloropropane	594-20-7		<1.0	U
1,1-Dichloropropene	563-58-6		<1.0	U
cis-1,3-Dichloropropene	10061-01-5		<1.0	U
trans-1,3-Dichloropropene	10061-02-6		<1.0	U
Ethylbenzene	100-41-4		<1.0	U
Methyl-t-butyl ether	1634-04-4		<1.0	U
Methylene chloride	75-09-2		<1.0	U
Methyl ethyl ketone	78-93-3		<20	U
Styrene	100-42-5		<1.0	U
1,1,1,2-Tetrachloroethane	630-20-6		<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5		<1.0	U
Tetrachloroethene	127-18-4		<1.0	U
Toluene	108-88-3		<1.0	U
1,1,1-Trichloroethane	71-55-6		<1.0	U
1,1,2-Trichloroethane	79-00-5		<1.0	U
Trichloroethene	79-01-6		<1.0	U
Trichlorofluoromethane	75-69-4		<1.0	U
1,2,3-Trichloropropene	96-18-4		<1.0	U
Vinyl chloride	75-01-4		<1.0	U
m+p-Xylenes	108383/106423		<1.0	U
o-Xylene	95-47-6		<1.0	U

Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	9.76	98	80--120
Toluene d8	10.0	10.9	109	80--120
p-Bromofluorobenzene	10.0	10.6	106	80--120

### QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

1= The recovery for this compound in the continuing calibration verification was below the laboratory standard operating procedure QC advisory limit.

REPORT COMMENTS: None

Analyst: [Signature] Reviewing Supervisor: [Signature]

/IONTRAP1.i/vb100499.b/20oct04.d

Quality Control Sample: Laboratory Reagent Blank 04-OCT-1999 19:53

Report Date: 10/11/99 14:10

Extraction Method: EPA 5030

Sample Matrix: WATER

Remarks: This Laboratory Reagent Blank Quality Control Sample was extracted and analyzed with your set of samples to determine if method analytes or other interferences are present in the laboratory environment, the reagents, or the apparatus.

EPA METHOD 8260A: VOLATILE ORGANICS ANALYSIS REPORT

CONCENTRATION UNITS = ug/L (ppb)			
COMPOUNDS	CAS NO.	RESULT	QUALIFIER
Benzene	71-43-2	<1.0	U
Bromobenzene	108-86-1	<1.0	U
Bromochloromethane	74-97-5	<1.0	U
Bromodichloromethane	75-27-4	<1.0	U
Bromoform	75-25-2	<1.0	U
Bromomethane	74-83-9	<1.0	U
Carbon tetrachloride	56-23-5	<1.0	U
Chlorobenzene	108-90-7	<1.0	U
Chloroethane	75-00-3	<1.0	U
2-Chloroethylvinyl ether	110-75-8	<1.0	U
Chloroform	67-66-3	<1.0	U
Chloromethane	74-87-3	<1.0	U
2-Chlorotoluene	95-49-8	<1.0	U
4-Chlorotoluene	106-43-4	<1.0	U
Chlorodibromomethane	124-48-1	<1.0	U
1,2-Dibromoethane	106-93-4	<1.0	U
Dibromomethane	74-95-3	<1.0	U
1,2-Dichlorobenzene	95-50-1	<1.0	U
1,3-Dichlorobenzene	541-73-1	<1.0	U
1,4-Dichlorobenzene	106-46-7	<1.0	U
Dichlorodifluoromethane	75-71-8	<1.0	U
1,1-Dichloroethane	75-34-3	<1.0	U
1,2-Dichloroethane	107-06-2	<1.0	U
1,1-Dichloroethene	75-35-4	<1.0	U
cis-1,2-Dichloroethene	156-59-2	<1.0	U
trans-1,2-Dichloroethene	156-60-5	<1.0	U
1,2-Dichloropropane	78-87-5	<1.0	U
1,3-Dichloropropane	142-28-9	<1.0	U
2,2-Dichloropropane	594-20-7	<1.0	U
1,1-Dichloropropene	563-58-6	<1.0	U
cis-1,3-Dichloropropene	10061-01-5	<1.0	U
trans-1,3-Dichloropropene	10061-02-6	<1.0	U
Ethylbenzene	100-41-4	<1.0	U
Methyl-t-butyl ether	1634-04-4	<1.0	U
Methylene chloride	75-09-2	<1.0	U
Methyl ethyl ketone	78-93-3	<20	U
Styrene	100-42-5	<1.0	U
1,1,1,2-Tetrachloroethane	630-20-6	<1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	<1.0	U
Tetrachloroethene	127-18-4	<1.0	U
Toluene	108-88-3	<1.0	U
1,1,1-Trichloroethane	71-55-6	<1.0	U
1,1,2-Trichloroethane	79-00-5	<1.0	U
Trichloroethene	79-01-6	<1.0	U
Trichlorofluoromethane	75-69-4	<1.0	U
1,2,3-Trichloropropane	96-18-4	<1.0	U
Vinyl chloride	75-01-4	<1.0	U
m+p-Xylenes	108383/106423	<1.0	U
o-Xylene	95-47-6	<1.0	U

----- SURROGATE RECOVERY REPORT -----				
Surrogate Compound	Added-ug/L	Measured-ug/L	%Rec	QC Limits
1,2-Dichloroethane d4	10.0	10.2	102	80--120
Toluene d8	10.0	11.2	112	80--120
p-Bromofluorobenzene	10.0	10.9	109	80--120

QUALIFIER CODE EXPLANATIONS AND NOTES:

U= Indicates compound was analyzed for but not detected.

REPORT COMMENTS: None

Analyst: 

Reviewing Supervisor: 

/IONTRAP1.i/vb100499.b/13oct04.d



# EPA METHOD 8260A: QUALITY ASSURANCE BLANK MATRIX SPIKE REPORT

Quality Control Sample: Reference Sample Analysis 30-SEP-99 22:29

Report Date: 10/01/99 10:19

Extraction Method: EPA 5030

Sample Matrix: WATER

File: /IONTRAP1.i/vb093099.b/13sep30.d

Remarks: This reference sample was spiked into a blank sample matrix then extracted and analyzed with your set of samples to determine if the methodology is in control and to monitor the laboratory's ability to produce accurate results.

CONCENTRATION UNITS = ug/L (ppb)				
Spike Compound	Added	Measured	%Rec	QC Limits
=====	=====	=====	=====	=====
Benzene	5.00	4.73	95	60--140
Bromobenzene	5.00	5.34	107	60--140
Bromochloromethane	5.00	4.54	91	60--140
Bromodichloromethane	5.00	4.94	99	60--140
Bromoform	5.00	5.07	101	60--140
Bromomethane	5.00	4.28	86	60--140
Carbon tetrachloride	5.00	4.94	99	60--140
Chlorobenzene	5.00	4.96	99	60--140
Chloroethane	5.00	4.07	81	60--140
2-Chloroethylvinyl ether	5.00	4.81	96	60--140
Chloroform	5.00	4.63	93	60--140
Chloromethane	5.00	4.80	96	60--140
2-Chlorotoluene	5.00	5.59	112	60--140
4-Chlorotoluene	5.00	5.37	107	60--140
1,2-Dibromoethane	5.00	4.51	90	60--140
Dibromomethane	5.00	4.74	95	60--140
1,2-Dichlorobenzene	5.00	5.47	109	60--140
1,3-Dichlorobenzene	5.00	5.37	107	60--140
1,4-Dichlorobenzene	5.00	5.06	101	60--140
Dichlorodifluoromethane	5.00	4.79	96	60--140
1,1-Dichloroethane	5.00	4.97	99	60--140
1,2-Dichloroethane	5.00	4.87	97	60--140
1,1-Dichloroethene	5.00	4.80	96	60--140
cis-1,2-Dichloroethene	5.00	4.51	90	60--140
trans-1,2-Dichloroethene	5.00	4.68	94	60--140
1,2-Dichloropropane	5.00	4.64	93	60--140
1,3-Dichloropropane	5.00	4.95	99	60--140
2,2-Dichloropropane	5.00	4.27	85	60--140
1,1-Dichloropropene	5.00	4.69	94	60--140
cis-1,3-Dichloropropene	5.30	5.08	96	60--140
trans-1,3-Dichloropropene	4.70	4.47	95	60--140
Methylene chloride	5.00	4.16	83	60--140
Methyl ethyl ketone	50.0	45.9	92	60--140
Styrene	5.00	4.78	96	60--140
1,1,1,2-Tetrachloroethane	5.00	4.99	100	60--140
1,1,2,2-Tetrachloroethane	5.00	4.90	98	60--140
Tetrachloroethene	5.00	4.90	98	60--140
Toluene	5.00	5.10	102	60--140
1,1,1-Trichloroethane	5.00	4.55	91	60--140
1,1,2-Trichloroethane	5.00	4.66	93	60--140
Trichloroethene	5.00	4.64	93	60--140
Trichlorofluoromethane	5.00	4.11	82	60--140
1,2,3-Trichloropropane	5.00	5.86	117	60--140
Vinyl chloride	5.00	4.30	86	60--140
m+p-Xylenes	10.0	9.71	97	60--140
o-Xylene	5.00	4.91	98	60--140
----- SURROGATE RECOVERY REPORT -----				
<u>Surrogate Compound</u>	<u>Added-ug/L</u>	<u>Measured-ug/L</u>	<u>%Rec</u>	<u>QC Limits</u>
1,2-Dichloroethane d4	10.0	9.20	92	80--120
Toluene d8	10.0	10.3	103	80--120
p-Bromofluorobenzene	10.0	10.2	102	80--120

REPORT COMMENTS: None

Analyst: BA Reviewing Supervisor: mm

Lab Nos.: 001-99-57415 - 007-99-574

Date: 29-SEP-99

Received by: Krystal Simcox

Logged In by: Krystal Simcox

### SAMPLE CONDITION QA/QC REPORT

This report provides information about the condition of the sample(s)  
and associated sample custody information on receipt at the laboratory.

Chain of Custody Form  
Completed & Signed

Yes Comments: \_\_\_\_\_

Chain of Custody Seal

No Comments: \_\_\_\_\_

Intact

N/A Comments: \_\_\_\_\_

Signature Match Chain of Custody vs. Seal

N/A Comments: \_\_\_\_\_

Samples Received Cold

Yes Comments: \_\_\_\_\_

Samples Received Within Holding Time

Yes Comments: \_\_\_\_\_

Samples Received in Proper Containers

Yes Comments: \_\_\_\_\_

Samples Received Properly Preserved

N/A Comments: \_\_\_\_\_

**Samples requiring analysis for volatile organics are tested for proper preservation at the time of analysis.  
Any preservation problems encountered for these samples are noted on the analytical parameter report pages.**

Client notified about sample discrepancies:

Who: \_\_\_\_\_ By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Method of Shipping: Fed Ex 803778417004

Additional comments: \_\_\_\_\_



## CHAIN OF CUSTODY RECORD

PLEASE PRINT OR TYPE ALL  
INFORMATION EXCEPT SIGNATURES

<b>BILLINGS, MT</b> P.O. Box 34916 (59107)    wmts 800-735-4459    voice 406-252-6325    fax 406-252-6069 1120 South 27th (59101)		<b>CASPER, WY</b> P.O. Box 3258 (82402)    wmts 888-235-0515    voice 307-235-0515    fax 307-234-1639 2393 Salt Creek Highway (82601)		<b>GILLETTE, WY</b> 1105 West First Street (82716)    voice 307-686-7175    fax 307-682-4625		<b>HELENA, MT</b> P.O. Box 5688 (59604)    voice 406-442-0711    fax 406-442-0711 2704 Billings Ave (59601)		<b>RAPID CITY, SD</b> P.O. Box 2470 (57109)    voice 605-442-1225    fax 605-442-1197 610 Farmwood (57101)	
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Login Date: \_\_\_\_\_  
 Shipped by: Fed Ex  
 Shipping Bill #: 903778417004  
 Code Six: \_\_\_\_\_  
 Signature Match?: Yes ☒ No ☐  
 If no - Reason: \_\_\_\_\_  
 Custody Seal: Yes ☒ No ☐  
 Intact: Yes ☒ No ☐

For Lab Use Only

P.O. #	Project Name / Address	Contact Name & Phone	Lab No.	DATE	TIME	Invoice to:	Report to:	number of containers	Sample Type: A W S V U O	Air Water Soils/Solids Vegetation Urine Other	Analysis Requested	Comments, Special Instructions, etc.
001	Livingston	Mike McKenzie 406-523-1150	57415	9/28	14:00	Yellowstone Vet	Mike McKenzie Livingston Missoula	2 W				
002				9/28	14:15	Hilman		2 W				
003				9/28	14:35	Fridley		2 W				
004				9/28	15:00	Humane Society		2 W				
005				9/28	15:05	Cowgarden		2 W				
006				9/28	15:15	Ohare		2 W				
007				9/28	15:30	Rustad house		2 W				

1. Relinquished (signature) [Signature] Date 9/28 Time 16:00  
 Received by: (signature) \_\_\_\_\_ Date 09/29/04 Time 1205  
 Relinquished (signature) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_  
 Received for Laboratory by: (signature) [Signature]



**ENERGY LABORATORIES, INC.**

P.O. BOX 30916 • 1120 SOUTH 27TH STREET • BILLINGS, MT 59107-0916 • PHONE (406) 252-6069  
FAX (406) 252-6069 • 1-800-735-4489 • E-MAIL eli@energylab.com

October 18, 1999

Mike McKinsey  
Envirocon, Inc.  
P.O. Box 16655  
Missoula, MT 59808

Dear Mike

On September 29, 1999, these samples, represented by our laboratory numbers 001-99-57415 through 007-99-57415, were submitted to our laboratory for analysis.

The test results and quality assurance were reviewed and approved by the undersigned.

Reviewed by:

A handwritten signature in dark ink, appearing to read "Wy Pippin", written over a horizontal line.

## Department of Public Health and Human Services

## ENVIRONMENTAL LABORATORY

Cogswell Building, Rm B219, 1400 Broadway, PO BOX 4369, Helena MT 59604 Phone 444-2642

JOHN WADHAMS  
DEQ REMEDIATION DIVISION  
PHEONIX BUILDING  
HELENA MT 59604

Acct #: SHW00002

PWSID #:

Report Date: 01-Oct-99

Collected: 9/28/99

Time: 15:22

By: JOHN WADHAMS

Lab#: C9909-105377

Sample ID: O'HARA WELL - SPLIT WITH ENVIROCAU

ANALYTE	UNIT	DATE	TIME
VOC - REGULATED		9/30/99	15:22

DEQ-MT-99-1115

## VOC - REGULATED

Benzene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Ethylbenzene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Toluene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
ortho Xylene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
meta plus para Xylene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Total Xylenes	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Total BTEX	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,2,4-Trichlorobenzene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,2-Dichlorobenzene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,4-Dichlorobenzene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Chlorobenzene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Carbon Tetrachloride	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,1,1-Trichloroethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,1,2-Trichloroethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,2-Dichloroethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,1-Dichloroethene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
cis 1,2-Dichloroethene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
trans 1,2-Dichloroethene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Methylene Chloride	< 2.00	ug/L	EPA 524.2	9/30/99	WS
1,2-Dichloropropane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Tetrachloroethene	1.39	ug/L	EPA 524.2	9/30/99	WS
Trichloroethene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Vinyl Chloride	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,2-Dibromo-3-Chloropropane	< 1.00	ug/L	EPA 524.2	9/30/99	WS
Styrene	< 0.50	ug/L	EPA 524.2	9/30/99	WS

Approved by: 

FLAGS: < = less-than  
> = greater-than

RECEIVED

OCT 05 1999

Department of  
Environmental Quality  
Remediation Division



# Department of Public Health and Human Services

## ENVIRONMENTAL LABORATORY

Cogswell Building, Rm B219, 1400 Broadway, PO BOX 4369, Helena MT 59604 Phone 444-2642

JOHN WADHAMS  
DEQ REMEDIATION DIVISION  
PHEONIX BUILDING  
HELENA MT 59604

Acct #: SHW00002  
PWSID #:  
Report Date: 01-Oct-99

Collected: 9/28/99  
Time: 15:22  
By: JOHN WADHAMS

Lab#: C9909-105377

Sample ID: O'HARA WELL -SPLIT WITH ENVIROCAU

ANALYTE	RESULT	UNIT	METHOD	DATE	TIME
---------	--------	------	--------	------	------

### ORGANIC PARAMETERS

#### VOC - STATE MONITORED

			EPA 524.2	9/30/99	WS
1,1-Dichloropropene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
cis 1,3-Dichloropropene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
trans 1,3-Dichloropropene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,3-Dichlorobenzene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
2-Chlorotoluene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
4-Chlorotoluene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Bromobenzene	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,1,1,2-Tetrachloroethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,1,2,2-Tetrachloroethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,1-Dichloroethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Chloroethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Bromomethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Chloromethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Dibromomethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,2,3-Trichloropropane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
1,3-Dichloropropane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
2,2-Dichloropropane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Methyl Tert Butyl Ether	< 1.50	ug/L	EPA 524.2	9/30/99	WS
TRIALOMETHANES			EPA 524.2	9/30/99	WS
Chloroform	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Bromodichloromethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Dibromochloromethane	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Bromoform	< 0.50	ug/L	EPA 524.2	9/30/99	WS
Total Trihalomethanes	< 2.00	ug/L	EPA 524.2	9/30/99	WS
VOC - UNREGULATED			EPA 524.2	9/30/99	WS

Approved by: 

FLAGS: < = less-than  
> = greater-than

## Department of Public Health and Human Services

## ENVIRONMENTAL LABORATORY

Cogswell Building, Rm B219, 1400 Broadway, PO BOX 4369, Helena MT 59604 Phone 444-2642

RESULTS OF ANALYSIS OF SAMPLES

JOHN WADHAMS  
DEQ REMEDIATION DIVISION  
PHEONIX BUILDING  
HELENA MT 59604

Acct #: SHW00002

PWSID #:

Report Date: 01-Oct-99

Collected: 9/28/99

Time: 15:22

By: JOHN WADHAMS

Lab#: C9909-105377

Sample ID: O'HARA WELL -SPLIT WITH ENVIROCAU

ANALYTE	CONC	UNIT	DETECT	DATE	LAB
---------	------	------	--------	------	-----

## ORGANIC CHLORIDES

1,2,3-Trichlorobenzene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
1,2,4-Trimethylbenzene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
1,3,5-Trimethylbenzene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
N-Butylbenzene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
N-Propylbenzene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
tert-Butylbenzene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
Dichlorodifluoromethane	<	0.50	ug/L	EPA 524.2	9/30/99	WS
1,2-Dibromoethane	<	0.50	ug/L	EPA 524.2	9/30/99	WS
Hexachlorobutadiene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
Isopropylbenzene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
4-Isopropyltoluene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
Bromochloromethane	<	0.50	ug/L	EPA 524.2	9/30/99	WS
Naphthalene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
sec-Butylbenzene	<	0.50	ug/L	EPA 524.2	9/30/99	WS
Trichlorofluoromethane	<	0.50	ug/L	EPA 524.2	9/30/99	WS

Approved by: 

FLAGS: < = less-than  
> = greater-than





## **APPENDIX D**

### **Well Logs for Wells East of the Yellowstone River**



# ENVIROCON WELL LOG

Page 1 of 1

Well: **94-1**  
 Project: **LRV**  
 Location:  
 Date Drilled: **3/30/94**  
 Surface Elev:  
 Screen Dia: **4"**  
 Casing Dia: **4"**  
 Drilling Co: **Hayes Drilling**  
 Driller: **Will Hayes**

Owner: **BNRR**  
 Project No: **140101**  
 Total Depth: **36'**  
 Elevation TOC:  
 Length: **10'**  
 Length: **26'**  
 Drilling Method: **Air Rotary**  
 Logged By: **John Mills**

Diameter: **6"**  
 Initial WL:  
 Slot Size: **.020**  
 Type: **PVC**

SKETCH MAP

DEPTH (ft)	WELL CONST.	SPT (blows/ft)	PID READING	SAMPLE NUMBER	GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (Color, Texture, Structures)
5						0'-3' Brown sandy soil
10						3'-12' Dry coarse sandy gravel
15						12'-20' Damp to wet coarse sandy gravel
20						20'-37' coarse wet sandy gravel
25						
30						
35						
40						
45						

Bent. chips

natural filterpack

# ENVIROCON WELL LOG

Page 1 of 1

Well: 94-2

Owner: BNRR

Project: ER

Project No: 140101

Location: LRV

Total Depth: 37.5'

Diameter: 6"

Date Drilled: 3/30/94

Elevation TOC:

Initial WL: 9'

Surface Elev:

Length: 10'

Slot Size: .020

Screen Dia: 2"

Length: 27.5'

Type: PVC

Casing Dia: 2"

Drilling Method: Air Rotary

Drilling Co: Hayes Drg

Logged By:

Driller: Will Hayes

John Mills

SKETCH MAP

DEPTH (ft)	WELL CONST.	SPT (blows/ft)	PID READING	SAMPLE NUMBER	GRAPHIC LOG	DESCRIPTION/SOIL CLASSIFICATION (Color, Texture, Structures)
5						0'-4' Sandy soil
10						4'-10' coarse sandy gravel
15						10'-37.5' wet sandy gravel
20						
25						
30						
35						
40						
45						

Bent.  
chips

← 10-20  
Sand



# ENVIROCON, INC.

## Well Log

Well Drilled: 92-2

Page 1 of 1

Sketch Map

Project: Livingston/BN

Owner: BN

Location: Livingston Rail  
Yard

Project No: 140101

Date Drilled: 4/14/92

Total Depth: 25'

Diameter: 6"

Surface Elev: 4455.7

Elevation TOC: 4457.9

Initial WL:

Screen Dia: 2"

Length: 6' - 25'

Slot Size: 0.02"

Casing Dia: 2"

Length: 0' - 6'

Type: Sch 40 PVC

Drilling Co: ESD, Inc.

Drilling Method: Air Rotary (Schramm T-64)

Notes:

Driller: Wayne Jewett

Logged By: Crowell Herrick

Depth (ft)	Well Construction	PID Reading	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
5					0' - 2' Moist, black, topsoil
10					2' - 10' Moist, brown, coarse sandy gravel
15					10' - 16' Wet, sandy gravel
20					14' Make water
25					16' - 23' Wet, coarse, sandy gravel
30					23' - 24' Brown, gravelly sand
35					24' - 25' Gray sandstone
40					TD = 25'
45					

# GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

## Owner and Location Information

Site Name: MURRAY JAMES

*yellowstone Vtd*

GWIC Id: 97349

Location (TRS): 02S 10E 08 A

County (MT): PARK

DNRC Water Right: Not Reported

Certificate of Survey: Not Reported

Block: Not Reported

Lot: Not Reported

Source of Data: Not Reported

Latitude (dd): 45.6800

Longitude (dd): -110.5131

Geomethod: TRS-TWN

Datum: 1927

Addition: Not Reported

Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 34.00

Static Water Level (ft): 10.00

Pumping Water Level (ft): 12.00

Yield (gpm): 40.00

Test Type: Not Reported

Test Duration:

Drill Stem Setting (ft):

Recovery Water Level (ft):

Recovery Time (hrs):

How Drilled: Not Reported

Driller's Name: Not Reported

Driller License: 001

Completion Date: Jan 01, 1970

Special Conditions: None Reported

Is Well Flowing?: No

Shut-In Pressure:

Well/Water Use: MEDICAL

## Casing Information

From	To	Diameter	Type
0	0	6.0	

## Perforation/Screen Information

No perforations are reported.

**Lithology Information** No lithology information reported.

## Site Notes

No notes available for this record.

## Well Notes

No notes available for this record.

These data represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted.

# GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

## Owner and Location Information

Site Name: HILLMAN ED

GWIC Id: 153621	Source of Data: LOG
Location (TRS): 02S 10E 08 ABC	Latitude (dd): 45.6809
County (MT): PARK	Longitude (dd): -110.5171
DNRC Water Right: 95517	Geomethod: TRS-TWN
Certificate of Survey: Not Reported	Datum: 1927
Block: Not Reported	Addition: COS 1317 BOULDER IND PARK
Lot: Not Reported	Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 27.00	How Drilled: ROTARY
Static Water Level (ft): 10.00	Driller's Name: ESD
Pumping Water Level (ft):	Driller License: WWC258
Yield (gpm): 20.00	Completion Date: Jul 28, 1995
Test Type: AIR	Special Conditions: None Reported
Test Duration:	Is Well Flowing?: No
Drill Stem Setting (ft):	Shut-In Pressure:
Recovery Water Level (ft):	Well/Water Use: DOMESTIC
Recovery Time (hrs):	

## Casing Information

From	To	Diameter	Type
-2.0	27.0	6.0	STEEL

## Perforation/Screen Information

No perforations are reported.

## Lithology Information

From	To	Description
0	20.0	GRAVEL & SAND
20.0	23.0	SAND & SMALL GRAVEL
23.0	28.0	GRAVEL
28.0	40.0	SHALE BEDROCK



02S 10E 08 ABC

115197

Form No. 603 (R 2-80)

## WELL LOG REPORT

File No. 43B-95517

State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.

<b>1. WELL OWNER</b> Name <u>Ed Hillman</u>		f) Duration of test: Pumping time _____ hrs. g) Recovery time _____ hrs. h) Recovery water level _____ ft. at _____ hrs. after pumping stopped.													
<b>2. CURRENT MAILING ADDRESS</b> <u>Hc 85 Box 4286</u> <u>Livingston mt 59047</u>		Wells intended to yield 100 gpm or more shall be tested for a period of 8 hours or more. The test shall follow the development of the well, and shall be conducted continuously at a constant discharge at least as great as the intended appropriation. In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form. NOTE: All wells shall be equipped with an access port 1/2 inch minimum or a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.													
<b>3. WELL LOCATION</b> <u>SW 1/4 NW 1/4 NE 1/4 Section 8</u> Township <u>25</u> N/S Range <u>10E</u> E/W County <u>Park</u> Gov'n't Lot _____, or Lot _____ Block _____ Subdivision Name <u>Boulder Industrial Park</u> Tract Number <u>1</u> <u>COS 1317</u>		<b>11. WAS WELL PLUGGED OR ABANDONED?</b> _____ Yes <u>✓</u> No If yes, how? _____													
<b>4. PROPOSED USE:</b> Domestic <input checked="" type="checkbox"/> Stock <input type="checkbox"/> Irrigation <input type="checkbox"/> Other <input type="checkbox"/> specify _____		<b>12. WELL LOG</b> Depth (ft.) From To Formation <u>HB</u>													
<b>5. TYPE OF WORK:</b> New well <input checked="" type="checkbox"/> Method: Dug <input type="checkbox"/> Bored <input type="checkbox"/> Deepened <input type="checkbox"/> Cable <input type="checkbox"/> Driven <input type="checkbox"/> Reconditioned <input type="checkbox"/> Rotary <input checked="" type="checkbox"/> Jetted <input type="checkbox"/>		<table border="1"> <tr> <td>0</td> <td>20</td> <td>gravel &amp; sand</td> </tr> <tr> <td>20</td> <td>23</td> <td>sand &amp; small gravel</td> </tr> <tr> <td>23</td> <td>28</td> <td>gravel</td> </tr> <tr> <td>28</td> <td>40</td> <td>shale bedrock</td> </tr> </table>		0	20	gravel & sand	20	23	sand & small gravel	23	28	gravel	28	40	shale bedrock
0	20	gravel & sand													
20	23	sand & small gravel													
23	28	gravel													
28	40	shale bedrock													
<b>6. DIMENSIONS: Diameter of Hole</b> Dia. <u>6</u> in. from <u>0</u> ft. to <u>40</u> ft. Dia. _____ in. from _____ ft. to _____ ft. Dia. _____ in. from _____ ft. to _____ ft.		<div style="border: 2px solid black; padding: 10px; text-align: center;"> <b>RECEIVED</b>   <b>AUG 09 1995</b>   <b>MONTANA D.N.R.C.</b>  <b>MAN FIELD OFFICE</b> </div>													
<b>7. CONSTRUCTION DETAILS:</b> Casing: Steel Dia. <u>6</u> from <u>12</u> ft. to <u>27</u> ft. Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/> Dia. _____ from _____ ft. to _____ ft. Type _____ Wall Thickness _____ Casing: Plastic Dia. _____ from _____ ft. to _____ ft. Weight _____ Dia. _____ from _____ ft. to _____ ft. PERFORATIONS: Yes <input type="checkbox"/> No <input type="checkbox"/> Type of perforator used _____ Size of perforations _____ in. by _____ in. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft.															
<b>SCREENS:</b> Yes <input type="checkbox"/> No <input type="checkbox"/> Manufacturer's Name _____ Type _____ Model No. _____ Dia. _____ Slot size _____ from _____ ft. to _____ ft. Dia. _____ Slot size _____ from _____ ft. to _____ ft.															
<b>GRAVEL PACKED:</b> Yes <input type="checkbox"/> No <input type="checkbox"/> Size of gravel _____ Gravel placed from _____ ft. to _____ ft. <b>ROUTED:</b> To what depth? <u>CONTINUED</u> Material used in grouting <u>BENTONITE</u>															
<b>8. WELL HEAD COMPLETION:</b> Pitless Adapter <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		ATTACH ADDITIONAL SHEETS IF NECESSARY													
<b>9. PUMP (If Installed)</b> Manufacturer's name _____ Type _____ Model No. _____ HP _____		<b>13. DATE COMPLETED</b> <u>7-28-95</u>													
<b>10. WELL TEST DATA</b> The information requested in this section is required for all wells. All depth measurements shall be from the top of the well casing. All wells under 100 gpm must be tested for a minimum of one hour and provide the following information: a) Air _____ Pump _____ Baller _____ b) Static water level immediately before testing _____ ft. If flowing: closed-in pressure _____ psi. _____ gpm. Flow controlled by: _____ valve, _____ reducers, _____ other, (specify) _____ c) Depth at which pump is set for test _____ d) The pumping rate: <u>20</u> gpm. e) Pumping water level _____ ft. at _____ hrs. after pumping began.		<b>14. DRILLER/CONTRACTOR'S CERTIFICATION</b> This well was drilled under my jurisdiction and this report is true to the best of my knowledge. <u>7-31-95</u> Date <u>ESB Inc.</u> Firm Name <u>109 E. Lewis Livingston</u> Address <u>Ed Hillman</u> Signature <u>258</u> License No.													

MONTANA DEPARTMENT OF NATURAL RESOURCES &amp; CONSERVATION

1520 EAST SIXTH AVENUE

HELENA, MONTANA 59620-2301

444-8810

DNRC

SEP 14 1995

# GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

## Owner and Location Information

Site Name: DEVELOPMENT FRIDLEY

GWIC Id: 151566	Source of Data: LOG
Location (TRS): 02S 10E 08 ABD	Latitude (dd): 45.6809
County (MT): PARK	Longitude (dd): -110.5144
DNRC Water Right: 95430	Geomethod: TRS-TWN
Certificate of Survey: Not Reported	Datum: 1927
Block: Not Reported	Addition: COS# 1317 * BOULDER IND. PARK
Lot: 3	Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 60.00	How Drilled: ROTARY
Static Water Level (ft): 10.00	Driller's Name: ESD
Pumping Water Level (ft): 60.00	Driller License: WWC258
Yield (gpm): 20.00	Completion Date: Jan 23, 1996
Test Type: AIR	Special Conditions: DEEPENED
Test Duration: 1.00	Is Well Flowing?: No
Drill Stem Setting (ft):	Shut-In Pressure:
Recovery Water Level (ft):	Well/Water Use: DOMESTIC
Recovery Time (hrs):	

## Casing Information

From	To	Diameter	Type
-2.0	25.0	6.0	STEEL
20.0	60.0	4.0	PVC

## Perforation/Screen Information

No perforations are reported.

## Lithology Information

From	To	Description
0	1.0	TOPSOIL
1.0	20.0	GRAVEL SAND
20.0	23.0	SAND GRAVEL
23.0	25.0	GRAVEL
25.0	32.0	GRAVEL
32.0	60.0	SHALE



## WELL LOG REPORT

File No. 43B-95430

State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.

OK

1. WELL OWNER  
Name Fridley Development

2. CURRENT MAILING ADDRESS  
Box 1058  
Livingston MT 59047

3. WELL LOCATION  
NESE 1/4 NW 1/4 NE 1/4 Section 8  
Township 25 N/S Range 10E E/W County  
Gov't Lot 3 or Lot 3 Block  
Subdivision Name Boulder Industrial Park  
Tract Number COS 1317

4. PROPOSED USE: Domestic ☒ Stock ☐ Irrigation ☐  
Other ☐ specify \_\_\_\_\_

5. TYPE OF WORK:  
New well ☒ Method: Dug ☐ Bored ☐  
Deepened ☐ Cable ☐ Driven ☐  
Reconditioned ☐ Rotary ☒ Jetted ☐

6. DIMENSIONS: Diameter of Hole  
Dia. 6 in. from 0 ft. to 25 ft.  
Dia. \_\_\_\_\_ in. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Dia. \_\_\_\_\_ in. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

7. CONSTRUCTION DETAILS:  
Casing: Steel Dia. 6 from +2 ft. to 25 ft.  
Threaded ☐ Welded ☒ Dia. \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Type \_\_\_\_\_ Wall Thickness 250  
Casing: Plastic Dia. \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Weight \_\_\_\_\_ Dia. \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
PERFORATIONS: Yes ☐ No ☐  
Type of perforator used \_\_\_\_\_  
Size of perforations \_\_\_\_\_ in. by \_\_\_\_\_ in.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
\_\_\_\_\_ perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

SCREENS: Yes ☐ No ☒  
Manufacturer's Name \_\_\_\_\_  
Type \_\_\_\_\_ Model No. \_\_\_\_\_  
Dia. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Dia. \_\_\_\_\_ Slot size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

GRAVEL PACKED: Yes ☐ No ☒ Size of gravel \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

GROUTED: To what depth? continuous ft.  
Material used in grouting Bentonite

8. WELL HEAD COMPLETION:  
Pitless Adapter ☐ Yes ☒ No

9. PUMP (if installed)  
Manufacturer's name \_\_\_\_\_  
Type \_\_\_\_\_ Model No. \_\_\_\_\_ HP. \_\_\_\_\_

10. WELL TEST DATA  
The information requested in this section is required for all wells. All depth measurements shall be from the top of the well casing.  
All wells under 100 gpm must be tested for a minimum of one hour and provide the following information:  
a) Air ☒ Pump ☐ Baller \_\_\_\_\_ ft. If flow-  
ing; closed-in pressure \_\_\_\_\_ psi. \_\_\_\_\_ gpm.  
Flow controlled by: \_\_\_\_\_ valve, \_\_\_\_\_ reducers, \_\_\_\_\_  
other, (specify) \_\_\_\_\_  
c) Depth at which pump is set for test \_\_\_\_\_  
d) The pumping rate: 30 gpm.  
e) Pumping water level 25 ft. at 1 hrs. after  
pumping began.

- f) Duration of test: Pumping time \_\_\_\_\_ hrs.  
g) Recovery time 25 hrs.  
h) Recovery water level 10 ft. at 25 hrs. after  
pumping stopped.

Wells intended to yield 100 gpm or more shall be tested for a period of 8 hours or more. The test shall follow the development of the well, and shall be conducted continuously at a constant discharge at least as great as the intended appropriation. In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form.

NOTE: All wells shall be equipped with an access port 1/2 inch minimum of a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.

11. WAS WELL PLUGGED OR ABANDONED? Yes ☐ No ☒  
If yes, how? \_\_\_\_\_

## 12. WELL LOG

Depth (ft.)		Formation
From	To	
0	1	TOPSOIL
1	50	gravel + sand
20	23	sand + gravel
23	25	gravel

RECEIVED

AUG 09 1995

MONTANA D.N.R.C.

MAN FIELD OFFICE

ATTACH ADDITIONAL SHEETS IF NECESSARY

13. DATE COMPLETED
- 7-31-95

## 14. DRILLER/CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge.

Date

7-31-95

Firm Name

ESSA INC

Address

109 E Lewis Livingston

Signature

Ed H. Lewis

License No.

258

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION  
1520 EAST SIXTH AVENUE HELENA, MONTANA 59601-2020

DNRC

M:151566

Form No. 103 (R 2-89)

## WELL LOG REPORT

File No. 43B-95434

*State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.*

[illegible]

**MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION**  
1520 EAST SIXTH AVENUE      HELENA, MONTANA 59620-2301      444-6610

# DNRC

## DEPARTMENT COPY

**DRILLER:** Please give this copy to the well owner to complete reverse side.  
**OWNER:** Complete reverse side and send to DNRC when the well is completed  
and the water has been used beneficially for the intended purpose.

N: 151566

# GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

## Owner and Location Information

Site Name: HUMANE SOCIETY PARK COUNTY

GWIC Id: 170497	Source of Data: LOG
Location (TRS): 02S 10E 08 AAB	Latitude (dd): 45.6829
County (MT): PARK	Longitude (dd): -110.5118
DNRC Water Right: Not Reported	Geomethod: TRS-TWN
Certificate of Survey: Not Reported	Datum: 1927
Block: Not Reported	Addition: Not Reported
Lot: Not Reported	Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 40.00	How Drilled: ROTARY
Static Water Level (ft): 14.00	Driller's Name: HILLMAN
Pumping Water Level (ft):	Driller License: WWC105
Yield (gpm): 180.00	Completion Date: Sep 24, 1998
Test Type: AIR	Special Conditions: None Reported
Test Duration: 1.00	Is Well Flowing?: No
Drill Stem Setting (ft):	Shut-In Pressure:
Recovery Water Level (ft):	Well/Water Use: DOMESTIC
Recovery Time (hrs): .00	

## Casing Information

From	To	Diameter	Type
-2.0	40.0	6.0	STEEL

## Perforation/Screen Information

No perforations are reported.

## Lithology Information

From	To	Description
0	40.0	SAND/GRAVEL

## Site Notes

No notes available for this record.

## Well Notes

No notes available for this record.



02S 10E 8 AAB

113096

Form No. 603 R2-97

## WELL LOG REPORT

File No. \_\_\_\_\_

<b>1. WELL OWNER</b> Name <u>Humane Society, Bozeman Co.</u>		conducted continuously at a constant discharge at least as great as the intended appropriation. In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form. <b>NOTE:</b> All wells shall be equipped with an access port 1/2 inch minimum or a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.				
<b>2. CURRENT MAILING ADDRESS</b> <u>P.O. Box 705</u> <u>Livingston, MT 59047</u>						
<b>3. WELL LOCATION</b> <u>NW</u> $\frac{1}{4}$ <u>NE</u> $\frac{1}{4}$ <u>NE</u> $\frac{1}{4}$ Section <u>8</u> Township <u>2</u> N/S Range <u>10</u> E/W County <u>Park</u> Gov't Lot _____, c. Lot _____, Block _____ Subdivision Name _____ Tract Number _____ Latitude _____ Longitude _____		<b>10. PUMPING TEST DATA</b> a) Static level immediately before testing _____ ft. b) Depth at which pump is set for test _____ ft. c) Pumping rate _____ gpm. d) Maximum drawdown _____ ft. e) Duration of test: pumping time _____ hrs/min recovery time _____ hrs/min f) Recovery level _____ ft. g) Duration of time to recovery level _____ hrs.				
<b>4. PROPOSED USE:</b> Domestic <input checked="" type="checkbox"/> Stock <input type="checkbox"/> Irrigation <input type="checkbox"/> Other <input type="checkbox"/> specify _____		<b>11. PUMP INSTALLATION INFORMATION</b> Installation depth _____ Actual pumping rate _____ Manufacturer's name _____ Type _____ Model No. _____ H.P. _____				
<b>5. TYPE OF WORK:</b> New well <input checked="" type="checkbox"/> Method: Dug <input type="checkbox"/> Bored <input type="checkbox"/> Deepened <input type="checkbox"/> Cable <input type="checkbox"/> Driven <input type="checkbox"/> Reconditioned <input type="checkbox"/> Rotary <input checked="" type="checkbox"/> Jetted <input type="checkbox"/>		<b>12. WAS WELL PLUGGED OR ABANDONED?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, how? _____				
<b>6. DIMENSIONS: Diameter of Hole</b> Dia. <u>6</u> in. from <u>20</u> ft. to <u>40</u> ft. Dia. _____ in. from _____ ft. to _____ ft. Dia. _____ in. from _____ ft. to _____ ft.		<b>13. WELL LOG</b> Depth (ft.) From To Formation <table border="1"> <tr> <td>0</td> <td>40</td> <td>Sand/Gravel</td> </tr> </table>		0	40	Sand/Gravel
0	40	Sand/Gravel				
<b>7. CONSTRUCTION DETAILS:</b> Casing, Steel Dia. <u>6 5/8</u> in. from <u>12</u> ft. to <u>40</u> ft. Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/> Dia. _____ in. from _____ ft. to _____ ft. Type <u>A53B</u> Wall Thickness <u>.250</u> Casing, Plastic Dia. _____ in. from _____ ft. to _____ ft. Threaded <input type="checkbox"/> Welded <input type="checkbox"/> Dia. _____ in. from _____ ft. to _____ ft. <b>PERFORATIONS:</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Type of perforator used _____ Size of perforations _____ in. by _____ in. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. <b>SCREENS:</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Manufacture's Name _____ Type _____ Model No. _____ Dia. _____ Slot size _____ from _____ ft. to _____ ft. Dia. _____ Slot size _____ from _____ ft. to _____ ft. <b>GRAVEL PACKED:</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Size of gravel _____ Gravel placed from _____ ft. to _____ ft. <b>GROUTED:</b> To what depth? <u>20</u> ft. Material used in grouting <u>benzite</u>		RECEIVED OCT 29 1998 DNRC - BOZEMAN REGIONAL OFFICE				
<b>8. WELL HEAD COMPLETION:</b> Pitless Adapter Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		<input type="checkbox"/> ADDITIONAL SHEETS ATTACHED				
<b>9. WELL TEST DATA</b> The information requested in this section is required for all wells. All depth measurements must be from the top of the well casing. All wells under 100 gpm must be tested for a minimum of one hour and provide the following information: a) Air <input checked="" type="checkbox"/> Pump _____ Bailer _____ b) Static water level immediately before testing <u>14'</u> ft. If flowing; closed-in pressure _____ psi _____ gpm. c) Pumping level after one hour _____ ft. d) Recovery level _____ ft. Time of recovery _____ min/hrs. e) Pumping rate <u>150</u> gpm. Wells intended to yield 100 gpm or more shall be tested for a period of 8 hours or more. The test shall follow the development of the well, and shall be		<b>14. YELLOWSTONE CLOSURE AREA: WATER TEMPERATURE</b> _____ <b>15. DATE COMPLETED</b> <u>9/24/98</u> <b>16. DRILLER/CONTRACTOR'S CERTIFICATION</b> This well was drilled under my jurisdiction and this report is true to the best of my knowledge. Date <u>9/29/98</u> <u>Hillman Drilling Inc.</u> Firm Name <u>922 Mary Rd. Bozeman MT</u> Address <u>Ken J. Hillman</u> Signature <u>LOS</u> License No.				

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION  
 48 N. LAST CHANCE GULCH P.O. BOX 201601 HELENA, MT 59620-1601 444-6610



NOV 1998

# GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

## Owner and Location Information

Site Name: GRAYBEAL DAVID G

GWIC Id: 165139  
Location (TRS): 02S 10E 08 AAB  
County (MT): PARK  
DNRC Water Right: 103071  
Certificate of Survey: Not Reported  
Block: Not Reported  
Lot: Not Reported

Source of Data: LOG  
Latitude (dd): 45.6828  
Longitude (dd): -110.5118  
Geomethod: TRS-TWN  
Datum: 1927  
Addition: Not Reported  
Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 58.00  
Static Water Level (ft): 8.00  
Pumping Water Level (ft): 55.00  
Yield (gpm): 400.00  
Test Type: AIR  
Test Duration: 1.00  
Drill Stem Setting (ft):  
Recovery Water Level (ft):  
Recovery Time (hrs):

How Drilled: ROTARY  
Driller's Name: VINCE HILLMAN  
Driller License: WWC436  
Completion Date: Aug 14, 1997  
Special Conditions: None Reported  
Is Well Flowing?: No  
Shut-In Pressure:  
Well/Water Use: DOMESTIC

## Casing Information

From	To	Diameter	Type
-2.0	58.0	6.0	STEEL

## Perforation/Screen Information

No perforations are reported.

## Lithology Information

From	To	Description
0	1.0	TOPSOIL
1.0	60.0	SAND & GRAVEL

## Site Notes

No notes available for this record.

## Well Notes



SEP 1997

## GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

40.6 m

5.413 m

## Owner and Location Information

Site Name: O'HARA TIM

GWIC Id: 149224	Source of Data: LOG
Location (TRS): 02S 10E 05 DCB	Latitude (dd): 45.6862
County (MT): PARK	Longitude (dd): -110.5172
DNRC Water Right: Not Reported	Geomethod: TRS-TWN
Certificate of Survey: Not Reported	Datum: 1927
Block: Not Reported	Addition: Not Reported
Lot: Not Reported	Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 39.00	How Drilled: ROTARY
Static Water Level (ft): 14.00	Driller's Name: HAYES
Pumping Water Level (ft): 35.00	Driller License: WWC361
Yield (gpm): 45.00	Completion Date: Dec 27, 1994
Test Type: AIR	Special Conditions: None Reported
Test Duration: 1.00	Is Well Flowing?: No
Drill Stem Setting (ft):	Shut-In Pressure:
Recovery Water Level (ft):	Well/Water Use: DOMESTIC
Recovery Time (hrs):	

## Casing Information

From	To	Diameter	Type
-1.5	37.0	6.0	STEEL

## Perforation/Screen Information

No perforations are reported.

## Lithology Information

From	To	Description
0	37.5	GRAVEL SAND COBBLES & A FEW SMALL BOULDERS
37.5	39.0	RED CLAY - DRY

## Site Notes

No notes available for this record.

## Well Notes

## WELL LOG REPORT

File No. \_\_\_\_\_

State law requires that the Bureau's copy be filed by the water well driller within 60 days after completion of the well.

<p><b>1. WELL OWNER</b> Name <u>TIM J. HAZA</u></p> <p><b>2. CURRENT MAILING ADDRESS</b> <u>RT 62 BOX 31323</u> <u>LIVINGSTON MT 59047</u></p> <p><b>3. WELL LOCATION</b> <u>NW</u> <u>1/4</u> <u>SW</u> <u>1/4</u> <u>SE</u> <u>1/4</u> Section <u>5</u> Township <u>2</u> N/S Range <u>10</u> EW County <u>PARK</u> Gov't Lot _____, or Lot _____, Block _____ Subdivision Name _____ Tract Number _____</p> <p><b>4. PROPOSED USE:</b> Domestic <input checked="" type="checkbox"/> Stock <input type="checkbox"/> Irrigation <input type="checkbox"/> Other <input type="checkbox"/> specify _____</p> <p><b>5. TYPE OF WORK:</b> New well <input checked="" type="checkbox"/> Method: Dug <input type="checkbox"/> Bored <input type="checkbox"/> Deepened <input type="checkbox"/> Cable <input type="checkbox"/> Driven <input type="checkbox"/> Reconditioned <input type="checkbox"/> Rotary <input checked="" type="checkbox"/> Jetted <input type="checkbox"/></p> <p><b>6. DIMENSIONS: Diameter of Hole</b> Dia. <u>6</u> in. from <u>0</u> ft. to <u>39</u> ft. Dia. _____ in. from _____ ft. to _____ ft. Dia. _____ in. from _____ ft. to _____ ft.</p> <p><b>7. CONSTRUCTION DETAILS:</b> Casing; Steel Dia. <u>6 5/8</u> from <u>18"</u> ft. to <u>37</u> ft. Threaded <input type="checkbox"/> Welded <input checked="" type="checkbox"/> Dia. _____ from _____ ft. to _____ ft. Type _____ Wall Thickness <u>.250</u> Casing; Plastic Dia. _____ from _____ ft. to _____ ft. Weight _____ Dia. _____ from _____ ft. to _____ ft. PERFORATIONS: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Type of perforator used _____ Size of perforations _____ in. by _____ in. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. _____ perforations from _____ ft. to _____ ft. SCREENS: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Manufacturer's Name _____ Type _____ Model No. _____ Dia. _____ Slot size _____ from _____ ft. to _____ ft. Dia. _____ Slot size _____ from _____ ft. to _____ ft. GRAVEL PACKED: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Size of gravel _____ Gravel placed from _____ ft. to _____ ft. GROUTED: To what depth? <u>20</u> ft. Material used in grouting <u>BENTONITE</u></p> <p><b>8. WELL HEAD COMPLETION:</b> Pitless Adapter <input type="checkbox"/> Yes <input type="checkbox"/> No <u>N/A</u></p> <p><b>9. PUMP (if installed)</b> Manufacturer's name <u>N/A</u> Type _____ Model No. _____ HP. _____</p> <p><b>10. WELL TEST DATA</b> The information requested in this section is required for all wells. All depth measurements shall be from the top of the well casing. All wells under 100 gpm must be tested for a minimum of one hour and provide the following information: a) Air <input checked="" type="checkbox"/> Pump _____ Bailer _____ b) Static water level immediately before testing <u>14</u> ft. if flowing; closed-in pressure _____ psi. _____ gpm. Flow controlled by: _____ valve, _____ reducers, _____ other, (specify) _____ c) Depth at which pump is set for test <u>35</u> d) The pumping rate: <u>45</u> gpm. e) Pumping water level <u>33</u> ft. at <u>1</u> hrs. after pumping began.</p>	<p>f) Duration of test: pumping time _____ hrs. g) Recovery time <u>1/4</u> hrs. h) Recovery water level _____ ft. at <u>1/4</u> hrs. after pumping stopped.</p> <p>Wells intended to yield 100 gpm or more shall be tested for a period of 8 hours or more. The test shall follow the development of the well, and shall be conducted continuously at a constant discharge at least as great as the intended appropriation. In addition to the above information, water level data shall be collected and recorded on the Department's "Aquifer Test Data" form.</p> <p>NOTE: All wells shall be equipped with an access port 1/2 inch minimum or a pressure gauge that will indicate the shut-in pressure of a flowing well. Removable caps are acceptable as access ports.</p> <p><b>11. WAS WELL PLUGGED OR ABANDONED?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, how? _____</p> <p><b>12. WELL LOG</b> Depth (ft.) From _____ To _____ Formation _____ <u>0</u> <u>37 1/2</u> <u>GRAVEL, SAND, COBBLES</u> <u>37 1/2</u> <u>39</u> <u>A FEW SMALL BOULDERS</u> <u>37 1/2</u> <u>39</u> <u>RED CLAY - DRY</u></p> <div style="text-align: center; border: 1px solid black; padding: 10px; margin: 20px;"> <p><b>RECEIVED</b></p> <p>FEB 14 1995</p> <p>MONTANA D.N.R.C.</p> <p>BOZEMAN FIELD OFFICE</p> </div> <p style="text-align: center;">ATTACH ADDITIONAL SHEETS IF NECESSARY</p> <p><b>13. YELLOWSTONE CLOSURE AREA: WATER TEMPERATURE</b> _____</p> <p><b>14. DATE COMPLETED</b> <u>12-27-94</u></p> <p><b>15. DRILLER/CONTRACTOR'S CERTIFICATION</b> This well was drilled under my jurisdiction and this report is true to the best of my knowledge. <u>12-27-94</u> Date <u>HAYES DRILLING</u> Firm Name <u>511 N. MONTANA AVE #A BOZEMAN</u> Address <u>Will Day</u> Signature <u>361</u> License No.</p>
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MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION  
1520 EAST SIXTH AVENUE P.O. BOX 202301 HELENA, MONTANA 59620-2301 444-6610

**DNRC**

MAR 13 1995



# GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

## Owner and Location Information

Site Name: RUSTAD HUBERT #1

GWIC Id: 97288  
Location (TRS): 02S 10E 05 A  
County (MT): PARK  
DNRC Water Right: Not Reported  
Certificate of Survey: Not Reported  
Block: Not Reported  
Lot: Not Reported

Source of Data: Not Reported  
Latitude (dd): 45.6947  
Longitude (dd): -110.5132  
Geomethod: TRS-TWN  
Datum: 1927  
Addition: Not Reported  
Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 10.00  
Static Water Level (ft): 5.00  
Pumping Water Level (ft):  
Yield (gpm):  
Test Type: Not Reported  
Test Duration:  
Drill Stem Setting (ft):  
Recovery Water Level (ft):  
Recovery Time (hrs):

How Drilled: Not Reported  
Driller's Name: Not Reported  
Driller License: Not Reported  
Completion Date: Jan 01, 1958  
Special Conditions: None Reported  
Is Well Flowing?: No  
Shut-In Pressure:  
Well/Water Use: DOMESTIC

## Casing Information

No casing information reported.

## Perforation/Screen Information

No perforations are reported.

## Lithology Information

No lithology information reported.

## Site Notes

No notes available for this record.

## Well Notes

No notes available for this record.

These data represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted.

# GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

## Owner and Location Information

Site Name: RUSTAD HUBERT #B

GWIC Id: 97287  
Location (TRS): 02S 10E 05 A  
County (MT): PARK  
DNRC Water Right: Not Reported  
Certificate of Survey: Not Reported  
Block: Not Reported  
Lot: Not Reported

Source of Data: Not Reported  
Latitude (dd): 45.6947  
Longitude (dd): -110.5132  
Geomethod: TRS-TWN  
Datum: 1927  
Addition: Not Reported  
Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 10.00  
Static Water Level (ft): 5.00  
Pumping Water Level (ft):  
Yield (gpm):  
Test Type: Not Reported  
Test Duration:  
Drill Stem Setting (ft):  
Recovery Water Level (ft):  
Recovery Time (hrs):

How Drilled: Not Reported  
Driller's Name: Not Reported  
Driller License: Not Reported  
Completion Date: Jan 01, 1900  
Special Conditions: None Reported  
Is Well Flowing?: No  
Shut-In Pressure:  
Well/Water Use: DOMESTIC

## Casing Information

No casing information reported.

## Perforation/Screen Information

No perforations are reported.

**Lithology Information**No lithology information reported.

## Site Notes

No notes available for this record.

## Well Notes

No notes available for this record.

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# GWIC Well Log Report

Montana Bureau of Mines and Geology  
Ground-Water Information Center

## Owner and Location Information

Site Name: RUSTAD HUBERT #C

GWIC Id: 97286  
Location (TRS): 02S 10E 05 A  
County (MT): PARK  
DNRC Water Right: Not Reported  
Certificate of Survey: Not Reported  
Block: Not Reported  
Lot: Not Reported

Source of Data: Not Reported  
Latitude (dd): 45.6947  
Longitude (dd): -110.5132  
Geomethod: TRS-TWN  
Datum: 1927  
Addition: Not Reported  
Subdivision: Not Reported

## Well Construction and Performance Data (measurements are reported below land surface)

Total Depth (ft): 10.00  
Static Water Level (ft): 5.00  
Pumping Water Level (ft):  
Yield (gpm):  
Test Type: Not Reported  
Test Duration:  
Drill Stem Setting (ft):  
Recovery Water Level (ft):  
Recovery Time (hrs):

How Drilled: Not Reported  
Driller's Name: Not Reported  
Driller License: Not Reported  
Completion Date: Jan 01,1900  
Special Conditions: None Reported  
Is Well Flowing?: No  
Shut-In Pressure:  
Well/Water Use: DOMESTIC

## Casing Information

No casing information reported.

## Perforation/Screen Information

No perforations are reported.

**Lithology Information**No lithology information reported.

## Site Notes

No notes available for this record.

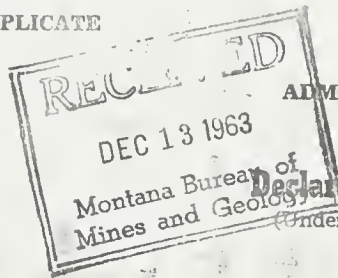
## Well Notes

No notes available for this record.

These data represent the contents of the GWIC databases at the Montana Bureau of Mines and Geology at the time and date of the retrieval. The information is considered unpublished and is subject to correction and review on a daily basis. The Bureau warrants the accurate transmission of the data to the original end user. Retransmission of the data to other users is discouraged and the Bureau claims no responsibility if the material is retransmitted.

File No. ....

TRIPLICATE



STATE OF MONTANA

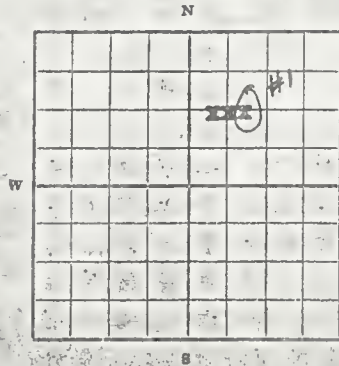
ADMINISTRATOR OF GROUNDWATER CODE

OFFICE OF STATE ENGINEER

## Declaration of Vested Groundwater Rights

(Under Chapter 237, Montana Session Laws, 1961)

1. Hubert Rustad (Name of Appropriator), of Box 973 (Address) Livingston (Town)  
 County of Park State of Montana  
 have appropriated groundwater according to the Montana laws in effect prior to January 1, 1962, as follows:



11 1/4 Sec. 5 T. 29 R. 10E

Indicate point of appropriation and place of use, if possible. Each small square represents 10 acres.

2. The beneficial use on which the claim is based Domestic and stock watering
3. Date or approximate date of earliest beneficial use; and how continuous the use has been 2 wells since about 1900, and one since 1958. Used continuously.
4. The amount of groundwater claimed (in miner's inches or gallons per minute) Unknown
5. If used for irrigation, give the acreage and description of the lands to which water has been applied and name of the owner thereof
6. The means of withdrawing such water from the ground and the location of each well or other means of withdrawal Hand dug wells, with electric pumps.
7. The date of commencement and completion of the construction of the well, wells, or other works for withdrawal of groundwater 2 in 1900, and other in 1958.
8. The depth of water table About 5 feet.
9. So far as it may be available, the type, size and depth of each well or the general specifications of any other works for the withdrawal of groundwater Wells have various types of pipe, rock and tile. Wells are about 10 feet deep.
10. The estimated amount of groundwater withdrawn each year Unknown
11. The log of formations encountered in the drilling of each well if available None
12. Such other information of a similar nature as may be useful in carrying out the policy of this act, including reference to book and page of any county record.

Signature of Owner Hubert RustadDate December 12, 1963

Three copies to be filed by the owner with the County Clerk and Recorder of the county in which the well is located.

Please answer all questions. If not applicable, so state, otherwise the form will be returned.

Original to the County Clerk and Recorder; duplicate to the State Engineer; Triplicate to the Montana Bureau of Mines and Geology and Quadruplicate for the Appropriator.

nd 07 1969

